COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

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NEWSPAPER

Do You Need A Good Fullback?

By Susan Blakeney
CW Staff

OKLAHOMA CITY — It looks as if the extra points in football this year will come from having a computer in the backfield.

Thanks to the Blue Chip Bureau here, college football recruiters and coaches all over the country can obtain vital statistics on eligible athletes from across the nation with a one-time request.

The new recruitment system is based on a data base of high school seniors capable of playing collegiate

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Manufacturing Hard Hit

DP Shops Feeling Recession Pinch

CW Staff Roundup

The recession has come home to roost as some DP departments are beginning to feel the pinch of current economic conditions, a nationwide telephone survey by *Computerworld* has found. The survey of 30 large corporations conducted last week found that 38% of the management information systems executives contacted have been forced to implement cost-cutting measures ranging from delayed hardware upgrades and acquisitions to cutbacks in software expenditures.

These findings corroborate results from a similar *Computerworld* survey conducted more than two years ago [CW, April 28, 1980]. Approximately 32% of the companies contacted in that survey were also attempting to control costs by reconsidering plans for hardware outlays or revamping schedules for hardware procurement.

The economic squeeze is affecting some industries more than others. Money problems are most acute in the entertainment and manufacturing industries, including oil compa-

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This survey was prepared and written by CW staffers Jim Bartimo, Susan Blakeney and Marcia Blumenthal.

Survey: Recession Puts Squeeze On DP Salaries, Staff Additions

The recession is taking its toll on DP salary increases. Twelve of the 30 DP executives interviewed by *Computerworld* last week have been forced to limit pay hikes for their personnel.

"We've reduced the number of raises and spread them out over a longer period of time," said Robert Taylor, vice-president for data processing and communications at Continental Grain, Inc. in New York City.

Hiring freezes have taken place in some firms with 28% of the respondents indicating some kind of limitation on hiring new personnel. "We're leaving programmers' and analysts' spots open," said Stewart Neill, vice-president of information systems and services at New York's Saks Fifth Avenue.

"We have openings for five professional positions right now which are not going to be filled," said one DP head at a Midwest paper manufacturing company. "We have frozen travel and attendance to conferences, but have not cut back on training."

"There is a hiring freeze companywide," said John Hill, director of DP for the San Francisco Newspaper Agency, "but we haven't hired any consultants [to make up for that]."

The use of consultants at 22 of the companies surveyed did not increase or decrease, but some companies are cutting back on hiring temporary help. "I think consultants are in for a rough couple of years," said Robert Trenchard, vice-president of management information systems for Columbia Pictures in New York.

Cites Pricing Problem

STC Scraps Plans to Market VSS

By Marcia Blumenthal
CW Staff

LOUISVILLE, Colo. — Storage Technology Corp. has abandoned plans to market the Virtual Storage System, which it claimed was "the missing element in IBM's MVS architecture." STC formally announced the product one year ago [CW, Aug. 10].

The reasons for dropping the highly complex back-end storage system, a combination of hardware and software designed to provide high-speed I/O capability, were murky. The company cited an inability to price the product at a level that was "attractive to both the user and the company," a spokesman said. STC also claimed it was unable to obtain the performance and reliability it wanted from the Virtual Control Processor, the hardware component of the system. The VCP was being supplied under an OEM contract by Magnuson Computer Systems, Inc.

STC said it had received some orders for the system, which was originally scheduled to start shipment this summer. "We coordinated the delay with our customers and kept in contact with them. No one was left hanging," the spokesman said. The STC spokesman estimated that a typical configuration of the VSS product would result in a storage cost of about $1.02 per 1M byte — a figure that the firm apparently considered too high.

Although STC claimed pricing and performance were the key issues in the decision to drop VSS, individuals

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Vion Sues FBI Over Controversial Systems Contract Award to IBM

By Jeffry Beeler
CW West Coast Bureau

WASHINGTON, D.C. — The Federal Bureau of Investigation was sued last week as a result of its controversial July 8 decision to award a multimillion-dollar systems contract to IBM rather than to a rival vendor that responded with a lower bid.

The lawsuit was filed on Aug. 4 by locally headquartered Vion Corp., which acquires Japanese-made mainframes from National Advanced Systems, Inc. and then resells the IBM-compatible machines to the federal government.

Vion President P. David Pappert justified the suit on the "constitutional" grounds that his company was "denied due process" when the FBI recently rejected a Vion contract proposal in favor of a higher bid from IBM.

During an Aug. 4 telephone interview, Pappert described the FBI's contract decision as a "political" move calculated to avoid "embarrassing" the U.S. government in the wake of allegations that NAS' hardware supplier, Hitachi Ltd., conspired to steal IBM technology.

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Monitor Tools Debut for IMS

By Lois Paul
CW Staff

SUNNYVALE, Calif. — Four interactive performance monitor and capacity management packages designed for users of IBM's IMS data base management system were unveiled here last week by Boole & Babbage, Inc.

Intended for use on IBM and plug-compatible mainframes, the new product architecture will be known as the IMS Management Facilities (IMF). It will incorporate the four IMS management products as well as the vendor's Control/IMS and Control/IMS Realtime packages.

IMF is intended to supply DP managers with a variety of tools to determine problems, implement solutions, plan for future growth and establish procedures that will respond automatically to common IMS problems.

The IMF architecture is modular in design to facilitate the needs of both large and small IMS users, the vendor explained. Its new products are IMF/Workload Analyzer, IMF/Trend Monitor, IMF/System Evaluator and IMF/System Manager.

IMF/Workload Analyzer reportedly facilitates real-time investigations of the performance of specific IMS transactions or work loads in order to identify problems that may be causing work load degradation.

IMF/Trend Monitor is said to use both work load and resource data to perform automatic trend analyses

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Managing Editor Rita Shoor
News Editor Cheryl M. Gelb
Senior Editors:
Features Catherine Marenghi
Software Lois Paul
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Systems Timothy J. Scannell
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Management Brad Schultz
Writer/Analysts: Marguerite Zientara, Tom Henkel
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Copy Editor Nancy Fleming

Please address all correspondence to the appropriate department at Box 880, 375 Cochituate Road, Framingham, Mass. 01701. Phone: (617) 879-0700. Telex: 95-1153.

OTHER EDITORIAL OFFICES:

New York City: Suite 7G, 401 East 80th St., New York, N.Y. 10021. Telephone: (212) 570-2135.

West Coast: 257 Lytton Ave., Palo Alto, Calif. 94301. Phone: (415) 328-8064.

Washington, D.C.: 880 National Press Building, 529 14th St. N.W., Washington, D.C. 20045. Phone: (202) 347-6718.

England: Richard Hease, ECC Publications, 30-31 Islington Green, London N1. Phone: (01) 359-7481.

W. Germany: Eckhard Utpadel, CW Publikationens, Friedrichstrasse 31, 8000 Munich 40. Phone: (089) 34-90-61. Telex: 5215350.

France: Patrick Morel, Le Monde Informatique, 42, Avenue Montaigne, 75008 Paris. Phone: 720.85.66.

Asia: Mr. Shohei Kurita, Computerworld Japan, 1-19-7 Shintomi, Chuo-ku, Tokyo 104. Phone: (03) 551-3882, Telex: 252-4217.

Australia: Alan Power, Computerworld Pty. Ltd., 37-43 Alexander Street, Crows Nest, NSW 2065. Phone: (02) 4395133, Telex: SECCO AA25468.

Brazil: Eric Hippeau, Data News, Computerworld do Brazil, Servicos e Publicacoes Ltda., Rua Alcindo Guanabara, 25/10th Floor 20031 Rio de Janeiro, RJ Brazil. Phone: (021) 240-8225. Telex: 2130838(WORD BR).

Mexico: Richard Small, Computerworld de Mexico, Oaxaca 21-2, Colonia Roma, Mexico City 7 D.F. Phone: (905) 514-4218, (905) 514-6309.

Spain: Neil Kelley, Computerworld/Espana, Barquillo, 38, Madrid-4.

Denmark: Helle Lind Christensen, Computerworld/Denmark, Gammel Strand 50, 1202 Copenhagen K. Phone: 01-1234-11.

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Wirth Urges Judge Greene to Reconsider AT&T Consent Decree Modifications

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — Having abandoned current efforts to restructure AT&T through new legislation, House Telecommunications Subcommittee Chairman Timothy Wirth (D-Colo.) has sent the panel's findings to federal Judge Harold Greene in the hope of influencing his decision on the consent decree modification agreement between AT&T and the Justice Department.

A July 27 letter from Wirth and four other subcommittee members to Greene, whose ruling on the modification is expected at any time, expressed the congressmen's concerns about the proposed terms of the settlement of Justice's antitrust suit against Bell.

With efforts to pass H.R. 5158 at least temporarily halted, "Divestiture [of AT&T] can no longer occur in the context of a uniform, congressionally mandated policy that reconciles the need to maintain universal service with antitrust decisions and the powerful forces of competition and new technology," the letter to Greene said.

Letter to Greene

The letter, which included the record of the subcommittee's lengthy hearing process, was signed by Wirth and fellow subcommittee members Representatives Edward J. Markey (D-Mass.), Al Swift (D-Wash.), Thomas J. Tauke (R-Iowa) and W.J. Tauzin (D-La.).

"Although we hope that future legislation will revise telecommunications policy, we do not assume that Congress will be able to reform the decree or rescue the [Bell] operating companies after the divestiture," the congressman told Greene.

The subcommittee's hearings, they said, persuaded them "the proposed decree, without modifications, would adversely affect the viability of local operating companies, the stability of local rates and the extent to which the U.S. will continue to enjoy the most universal telephone network in the world."

Three Critical Areas

The letter outlined three "critical areas" in which, they said, "ratepayers cannot await the possibility of legislation in the next Congress." The proposed consent decree modifications may fail to provide "adequate procedural safeguards for the operating companies," according to the letter.

In addition, the divestiture procedures should take into consideration that the operating companies must keep Yellow Pages and installed terminal equipment to protect their rate bases and that the divestiture may preempt state and federal laws and policies vital to regulating the operating companies, they said.

The letter concluded with the subcommittee members' pledge to oversee the Federal Communications Commission's responsibilities in the divestiture process and said the signers "remain committed to enacting a revised telecommunications policy."

Corrections

Relative performance and million instructions per second (Mips) figures for Stratus Computer, Inc.'s Stratus/32 processor described in *Computerworld's* Hardware Roundup [CW, Aug. 2] were incorrect. The relative performance number should have been 52 and the Mips figure should have been .9.

In the announcement of Software Module Marketing's (SMM) SMM/Fastcopy utility for IBM MVS systems [CW, July 12], IEBcopy was incorrectly identified as an SMM product. IEBcopy is a standard IBM utility product used to move, copy, load or unload partitioned data sets. The vendor claimed SMM/Fastcopy outperforms IEBcopy while, at the same time, reducing resource utilization.

SMM/Fastcopy performs a compress operation on every partitioned data set on a specific direct-access storage device volume or group of volumes through submission of only one job step, the vendor explained. SMM/Fastcopy is said to require no changes to the job control language, and any program that dynamically invokes IEBcopy will function as before. The software is available for $3,500 from Software Module Marketing, 1007 Seventh St., Sacramento, Calif. 95814.

The address of IDC/Madic's Wellesley, Mass., public relations agency was mistakenly listed as the vendor's address with the announcement of the Santa Clara, Calif.-based firm's Madic manufacturing information system [CW, July 19]. The correct address for IDC/Madic is 2560 Mission College Blvd., Santa Clara, Calif. 95954.

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GRADUATE

How did 783 users grade SyncSort?

(Magna cum loudly!)

Call (201) 568-9700.

Ask for the latest IDC sort survey.

The SyncSort Institute of Technology is never going to be one of the nation's great athletic powers. Why, we doubt that our softball team could even beat IBM's!

But when it comes to academic excellence, that's a different story entirely. Our sort programs are consistently rated No. 1 in performance by the people who know them best—SyncSort users. Here's a recent example of what happened to our most brilliant sorting graduate:

The International Data Corporation surveyed SyncSort users—and 783 replies were received. The users were asked to rate SyncSort in two vital areas: (1) Product Reliability and (2) Customer Service. The charts below show the results. With a G. P. A. like that SyncSort is never going to have to sue to get into medical school.

• PRODUCT RELIABILITY—93% of those polled rated SyncSort's reliability either very good or excellent. Not bad for a sort program that was bred originally for blinding performance.

You'll remember that SyncSort made its reputation by reducing the amount of computer resources that go into sorting. Compared to any of IBM's sorts, SyncSort will save you as much as:

- 50% in Supervisor State CPU Time;
- 28% in Problem State CPU Time;
- 46% in SIOs.

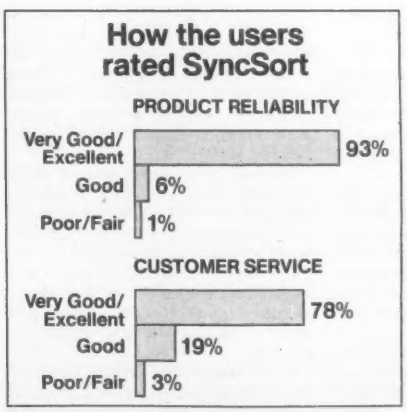
Yet the majority of those who responded to our survey tell us that our lean and speedy thoroughbred is as reliable as Old Dobbin. Why, it's as though Sir Isaac Newton had just been named "Miss Congeniality."

• CUSTOMER SERVICE—78% of those polled rated SyncSort's Technical Service as either very good or excellent.

Apparently more and more SyncSort users are discovering for themselves what we've been saying all along—that our customer service is absolutely the best in the sorting field. More than 85% of all requests for sorting assistance are resolved within 24 hours!

To all those who participated in the survey, our warm thanks. And to those who have not yet become SyncSort users, repent! It is never too late to join the sorting majority.

Just give us a call and we'll send over one of our bright Systems Engineers. He or she will tell you everything you want to know about SyncSort. And if you're really lucky, you may even get a private rendition of the famous S. I. T. Fight Song: "I'm a ramblin' wreck from SyncSort Tech and a helluva 'n engineer..."



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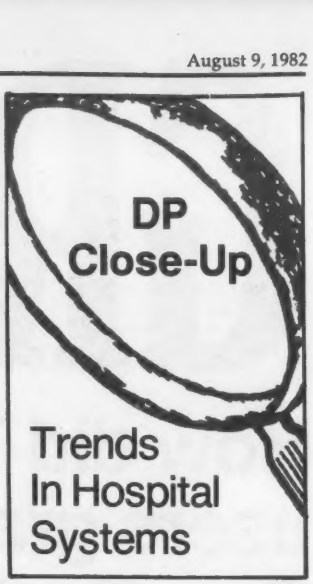
Hospital DP Facing Massive Growth



By Lois Paul
CW Staff

The need to reduce costs while providing additional services will lead to changes and an expansion of hospital DP systems over the next decade, based on recent surveys and analysts' reports.

According to a report from Frost & Sullivan, Inc., "hospitals are poised for a major sweep into information systems. The addition of services such as outpatient, ambulatory care and skilled nursing home care will lead to increased hospital computerization, especially turnkey systems."

The 231-page study predicted that the DP hospital market will increase from $1.3 billion in 1981 to $4 billion in 1986 (see chart). Predicasts, Inc., a Cleveland, Ohio, market research firm, went even further by forecasting that this market will reach $6 billion by 1995.

According to John Guerrieri, a Chicago-based independent consultant who was the project director for the Frost & Sullivan report, the increase in hospital DP expenditures will be keyed by the need for larger hospitals to replace their current older systems, as well as by the emergence of smaller hospitals as first-time DP users.

Herb Gepner, software analyst for Data Decisions, Inc. in Cherry Hill, N.J., attributed the surge in hospital DP expenditures to three factors: control of high costs, reduction of manual manpower efforts to free people and the increasing need in hospitals for dramatically fast turnaround of information.

"Computers will be at the core of trying to make hospitals more cost-effective," Ken Horner, a partner with the management consulting group of Touche, Ross & Co. in New York, said. However, because of budget considerations, hospitals generally will buy rather than build systems.

Turnkey System as Leader

According to Frost & Sullivan's report, "it is the turnkey system that will lead in market growth." This category's 17% market share in 1981 is expected to become a 33% proportion by 1986. Predicasts, Inc.'s survey concurred with these findings, indicating that software will remain the fastest growing segment of the health DP market through 1995 and that the principal growth will remain concentrated in the equipment-tied sector.

"In general, what we find is that the average 250- to 350-bed community hospital just does not have the resources to be in the computer systems development business. Their need for financial systems or patient-care systems can be met very nicely by a turnkey systems vendor," Horner said.

In addition, the turnkey vendor has a distinct advantage over some competitors simply because of experience in the health-care field that is not shared by general-purpose software developers, he added.

Guerrieri suggested that even larger hospitals will be looking to some combination of hardware and software, which may not be a traditional turnkey system, but will be something that they buy rather than build themselves. "I would see in the future less of a single-mainframe-type system and more of a distributed DP system," he added.

"On the other hand, shared services — which had tripled in the 1972-1980 time frame — will show a growth of just 8% annually through 1995, when they will exceed $1 billion," the Predicasts report continued. The Frost & Sullivan report conclusions were similar, indicating that hospital expenditures on outside services will decline steeply from 27% to 8.3% over the five-year time frame.

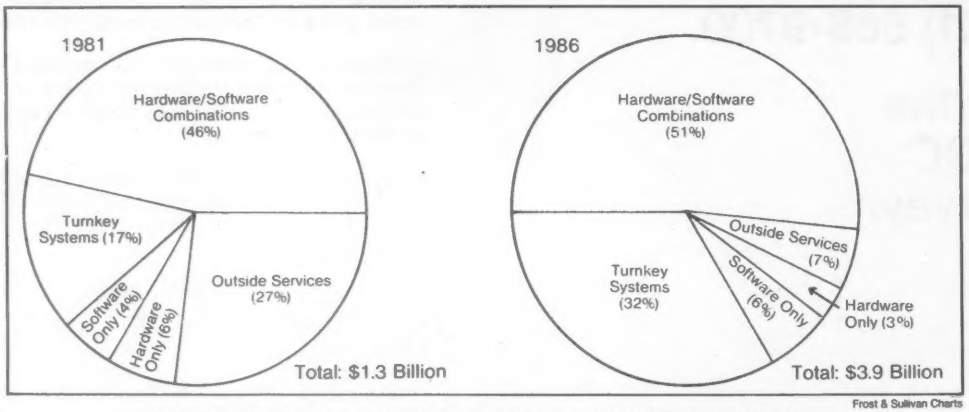
Guerrieri also suggested changes in hospital DP will signal a shift in the role of the DP manager within these organizations. "As you distribute data processing to things that haven't had it before, by definition you have to learn more about the hospital." He noted that it will be necessary either for the DP manager to gain more expertise about health care or to bring people with health-care capabilities onto his staff.

Predictions for '86

The Frost & Sullivan researchers predicted that all U.S. hospitals will employ some form of DP support by 1986, with 75% using in-house systems by then. Expenditures on hardware/software combinations, will increase from a 46% share to a 51% share between 1981 and 1986.

The Predicasts report indicated that although software will remain the fastest growing segment of the hospital DP market through 1995, hardware will remain the dominant segment, based on the anticipated rapid growth of microcomputers. The surveyors predicted that mainframes will exhibit the slowest growth through 1995, averaging just 4.1% annually.

Frost & Sullivan's Report No. 945 on Hospital EDP is available for $1,150 from the firm at 106 Fulton St., New York, N.Y. 10038. Predicasts' study No. E63 — Health Care EDP — is priced at $900 from the firm at 11001 Cedar Ave., Cleveland, Ohio 44106.



Estimated Distribution of Hospital Expenditures on DP Products and Services

Boole & Babbage Unwrap Monitors for IMS

(Continued from Page 1)

over time. These were designed to aid the user in determining which problems are ongoing and which are transient and the appropriate actions that need to be taken.

IMF/System Evaluator uses the output of the IMF exception and trend monitors to provide real-time reports on the causes of work load or resource problems, the vendor said. It was designed to measure, correlate, analyze and recommend corrective actions for performance problems.

IMF/System Manager is described by the vendor as an on-line program to control the resources allocated to an IMS subsystem. Using the recommendations produced by IMF/System Evaluator, warnings and messages generated by IMS or time and resource conditions defined by the user, IMF/System Manager is said to automatically start, reassign or stop IMS-assigned resources to assure both optimum use of resources and the fulfillment of performance objectives. In addition, it was designed to interact with IMS through IBM's Automated Operator Interface.

In addition to the new products, the vendor has enhanced its Control/IMS Realtime capabilities and integrated them into the new architecture as IMS/Resource Analyzer, IMF/Workload Monitor and IMF/Resource Monitor. IMS/Resource Analyzer provides real-time displays designed to aid the master terminal operator or systems programmer in the diagnosis of resource consumption problems.

IMF/Workload Monitor is described by the vendor as an independent real-time performance exception monitor that uses thresholds defined by the user. IMF/Resource Monitor reportedly provides asynchronous early warnings of potential resource problems.

The functions and options of Control/IMS, with additional enhancements, are now included in IMF/Performance Reporting and IMF/Transaction Accounting, the vendor said. IMF/Performance Reporting is an off-line analysis system intended to produce performance reports and plots to help the IMS administrator understand the performance of an IMS system. IMF/Transaction Accounting was designed to provide a charge-back facility to distribute the expense of IMS processing to users and cost accounting to help manage IMS operation expenses.

Among the features available with the IMF products are automatic screen refresh, dynamic screen support, intersystem communications, enhanced logging and reporting capabilities, on-line tutorials, menu-driven design and color graphics, the vendor noted.

The IMF/Workload Analyzer, IMF/Resource Analyzer, IMF/Workload Monitor and IMF/Resource Monitor will be available in the fourth quarter of 1982. At that time, current Control/IMS Realtime installations will be converted to the new IMF architecture with no loss of function and at no increased cost, the vendor explained.

At the same time, current Control/IMS installations will be converted to IMF/Performance Reporting and IMF/Transaction Accounting at no additional cost. The four new IMF products — IMF/Workload Analyzer, IMF/Trend Monitor, IMF/System Evaluator and IMF/System Manager — will be introduced individually through 1983.

Individual components will be priced separately and will range from $10,000 to $25,000 each, the vendor said from 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

New Document at Issue

Burroughs B800 Case Going Back to Court

By Tim Scannell
CW Staff

TWIN FALLS, Idaho — The owner of a small machine shop, who earlier won a more than four-year-old suit filed against Burroughs Corp. for an allegedly inoperable B800 minicomputer system, will return to U.S. District Court here today seeking to obtain evidence needed for a new trial.

Attorney Thomas L. Stephan, representing Gary Oliver, the owner and president of Century Automotive Machines, will argue in favor of a motion filed two weeks ago to produce a reportedly incriminating document that surfaced after the initial trial ended last April. Stephan contends that had the document then been entered as evidence, it could have helped find the minicomputer maker guilty of fraud and might have resulted in a harsher verdict.

Burroughs, on the other hand, insists that the document has been produced in other cases and has no bearing on Century Automotive's case. "They are desperately trying to find a peg to get a new trial and this is one of the things that they have cited," a spokesman for the firm said. "But we are confident that the judge will rule that it is irrelevant to this case."

Jury Trial Results

At the jury trial in April, Burroughs was found guilty of misrepresenting the capabilities of its B800 computer system and was ordered to pay $47,200 in damages. Century Automotive had filed charges of fraud and asked for $835,000 in mostly punitive damages.

However, these points were dismissed by Judge Daniel L. Meehl for lack of sufficient evidence and because the firm's charges of fraud did not carry all of the elements necessary to be valid under Idaho law [CW, May 3].

Stephan filed a motion for a new trial within weeks after the jury had found Burroughs guilty of misrepresentation. He is basing his motion on the existence of internal memorandums that detail significant file-handling problems associated with the B800 computer. The problems are reportedly severe enough to cause a total system shutdown if two terminals try to access the same information at the same time.

Burroughs Documents

The Burroughs' documents — which are reportedly being held in Judge Meehl's chambers and have been reviewed by Stephan and attorneys involved with other B800 cases — are not the only memos that mention multiprogramming and file-handling problems concerning the B800 system.

During the April trial, Century Automotive introduced as evidence what is now called "The Markham Memorandum," named after Jay P. Markham, a senior systems specialist with Burroughs who drafted the letter and sent it to another Burroughs executive on Jan. 31, 1978. The memo is concerned with problems that center on the B800's Computer Management System. It specifically mentions the system's inability to handle multiple accesses to the same key file.

The firm also produced a memo written by James K. McKinnon to two other Burroughs executives about the same file problem.

Unfortunately, both documents were not accepted as evidence in Century Automotive's trial since they were reportedly drafted after the B800 computer system in question was sold to the Twin Falls firm, Stephan noted.

Century Automotive's motion for a new trial, however, centers around a third document or group of memos that detail the B800's file-handling problems. These memos are allegedly dated prior to the system's sale.

"We feel it's more damaging than the ones that weren't allowed to be submitted during the trial," Oliver stated.

Wang Institute Awards First Master's Degrees

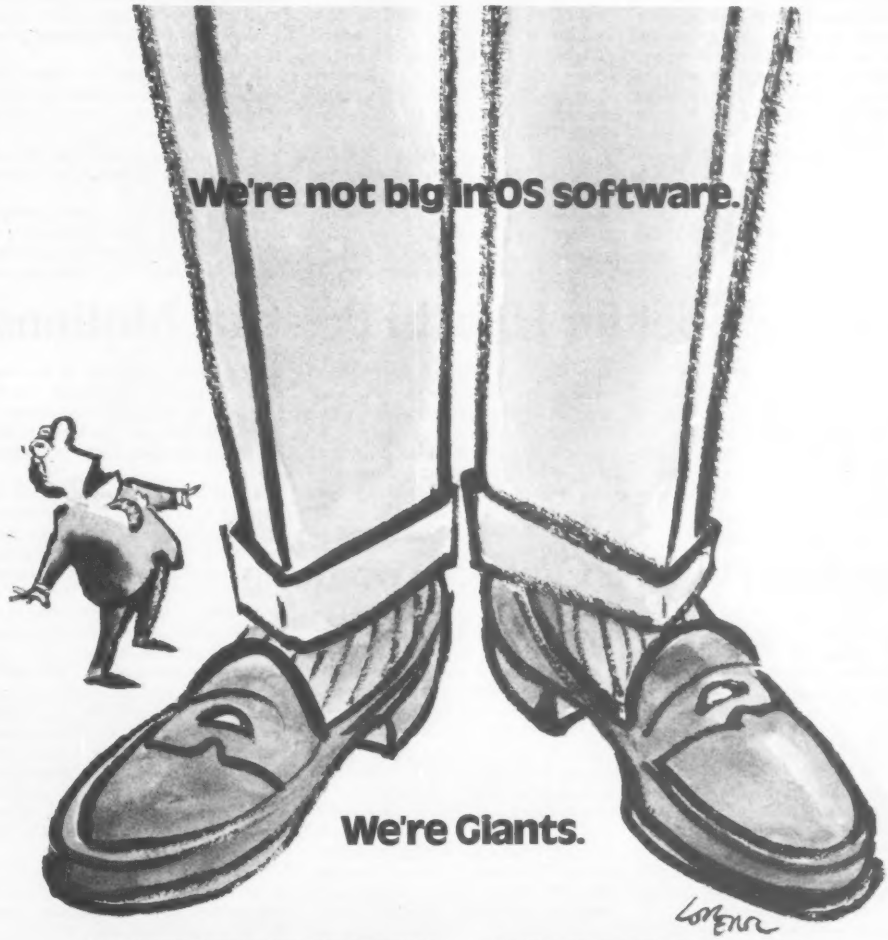
TYNGSBORO, Mass. — The Wang Institute of Graduate Studies held its first graduation ceremony here yesterday, awarding five students master of software engineering degrees.

Established in 1979, the institute offers the software engineering master's program on a full- or part-time basis. The program consists of 11 courses.

Currently there are 23 students enrolled in the program. Part-time students include employees from IBM, Hewlett-Packard Co., Prime Computer, Inc. and Data General Corp. among others.

The curriculum, which can be completed in one year by full-time students, consists of six core courses, three electives and two project courses.

Students in the current graduating class have done projects at a small computer manufacturer, a noncomputer manufacturing company and for the City Planning Commission of Nashua, N.H.



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COMPUTER ASSOCIATES

Hitachi Pleads Innocent, Hints at Defense

By Jeffry Beeler
CW West Coast Bureau

SAN JOSE, Calif. — Hitachi Ltd. late last month pleaded innocent to charges it conspired to steal IBM trade secrets and then dropped a subtle hint or two about exactly how it plans to defend itself in court.

The hints came from Hitachi's lead defense attorney Peter Fleming Jr., who issued a prepared statement July 29 shortly after his client appeared in the U.S. District Court here for formal arraignment.

Fleming used his statement as an occasion to accuse federal investigators of "instigating" the alleged theft scheme that ultimately led to the Japanese firm's indictment.

Fleming's accusation echoed Hitachi's repeated assertion that the company was "entrapped" into participating in the trade-secrets theft plot and suggests that the "entrapment" argument may form one of the pillars of the firm's defense strategy.

Hitachi's cries of government entrapment contrast starkly with recent reports from the FBI, which purportedly launched its "sting" operation against the Japanese only after learning that the company had already obtained several confidential IBM documents.

Fleming's statement also accuses the federal government of allowing IBM to call the shots in the FBI's undercover investigation of Hitachi. "The elaborate undercover scheme appears to have been guided by an IBM security official posing as a legitimate attorney at law," the defense counsel said.

The July 29 statement was issued only moments after Hitachi pleaded not guilty before federal Magistrate Nordin Blacker, who set Aug. 3 as the deadline for both sides to file their motions.

In addition to delivering a prepared statement, Fleming held a brief post-arraignment press conference during which he described the Hitachi scandal as "one of the most complex cases I've ever been involved with in 20 years of practice."

The facts of the case itself, the nature of the FBI's undercover investigation, the government's close contact with IBM and the profound differences between Japanese and American culture — all these factors contribute to the legal dispute's "extraordinary complexity," he said.

Asked to outline his client's probable defense strategy, Fleming declined all comment other than to say that the government's undercover investigation and its heavy reliance on IBM would probably be key targets in Hitachi's legal counterattack.

In other impromptu remarks, Fleming expressed hope that the defense and prosecution might eventually resolve their legal differences even before the trade-secrets theft case goes to trial. But when asked whether an out-of-court settlement is likely, he hesitated to speculate.

"To try to answer that kind of question would be like gambling in Las Vegas," Fleming replied.

NAS Exec Says Objectives Unchanged

Hitachi to Remain in U.S. Mainframe Mart

By Jeffry Beeler
CW West Coast Bureau

MOUNTAIN VIEW, Calif. — Hitachi Ltd.'s recent indictment for conspiring to steal IBM trade secrets has done nothing to shake the Japanese company's determination to continue competing in the U.S. plug-compatible mainframe business.

That assertion comes from National Advanced Systems, Inc. (NAS) President Floyd Kvamme, whose company depends on Hitachi as the source for many of NAS's IBM-compatible processors.

"They [Hitachi] have absolutely no intention to change their U.S. business objectives," delay their future product introductions or cancel any of their ongoing development plans, the NAS chief said.

Kvamme expressed his views during an Aug. 2 telephone interview that came hard on the heels of his latest business trip to Japan, where he recently met with Hitachi officials for three days of high-level discussions.

Although the July 12-14 meeting took place only about three weeks after the IBM trade-secrets theft case first came to light, the conferees reportedly spent very little of their time discussing Hitachi's current legal predicament. Instead, the discussions focused almost entirely on product planning issues and other routine business matters, Kvamme said.

Hitachi and NAS officials meet in Japan approximately once every quarter to discuss their mutual business interests, review their long-range product plans and address any other important items that may have arisen during the preceding three months. The latest of these prearranged strategy sessions proved "no different" from any of its predecessors and the conference's timing was in no way related to Hitachi's recent imbroglio with IBM, Kvamme said.

In fact, he noted, the meeting had already been scheduled long before the industrial espionage scandal ever surfaced.

Exactly how, if at all, the IBM case will eventually affect Hitachi's U.S. mainframe strategy remains to be seen, the NAS president said.

"At the moment, the impact [on the firm's business dealings] is still extremely difficult to assess," he said. "I think it's too early, too close to the original event to know precisely what the ultimate effect will be."

In other comments, Kvamme dismissed recent Japanese and U.S. news stories that reported Hitachi as having decided to postpone the American debut of the company's latest number-crunching "supercomputer." Rumors of the delivery delay are based on "pure speculation," he said, and originated from sources other than Hitachi itself.

'Exactly on Schedule'

The truth of the matter is that efforts to ready the new supercomputer for its U.S. introduction are proceeding "exactly according to schedule," Kvamme added.

In response to a question about whether the IBM case has left Hitachi officials angry and resentful, the NAS president confessed a certain degree of ignorance. "Frankly, I know very little about how the Japanese are reacting [to the federal government's undercover investigation] because we were extremely careful to steer clear of that whole area of conversation," he said.

"We limited our discussions almost entirely to the business aspects of what's happening with our products."

New Date Set for Hitachi Pre-trial Motions

By Jeffry Beeler
CW West Coast Bureau

SAN FRANCISCO — A federal judge last week agreed to give Hitachi Ltd. and four Japanese businessmen several additional months to prepare for trial in the IBM trade-secrets theft case.

During a brief hearing in U.S. District Court Aug. 3, Judge Spencer Williams set Dec. 6 as the new deadline for defense attorneys in the case to file their pretrial motions.

The trial, whose revised starting date will be announced during the Dec. 6 hearing, had originally been scheduled to begin Aug. 23.

Judge Williams' decision to postpone the trial was given in response to the defendants' complaint that the Hitachi case is much too complex to permit attorneys to prepare an adequate defense before the end of the month.

As matters stand now, the trial involving Hitachi and the four indicted employees is still set to take place in nearby San Jose. But during last week's appearance before Williams, Hitachi attorney Peter Fleming Jr. raised the possibility that defense attorneys would seek to have the trial moved to another location.

Ever since news of the IBM trade-secrets theft scandal first broke on June 22, the defendants' legal problems have been the subject of intense and continuing Silicon Valley publicity. That fact may have prejudiced public opinion in the case and reduced the chances that the defendants could receive a fair trial in San Jose.

On hand for the Aug. 3 courtroom gathering were four of the 21 individuals who have been indicted thus far in connection with an alleged Japanese conspiracy to steal confidential IBM product information.

The quartet includes Kenji Hayashi, a senior engineer with Hitachi's Kanagawa Works; Kunimasa Inoue, a programmer with Hitachi's U.S. subsidiary, Hitachi America Ltd.; Isao Ohnishi, a section manager with Hitachi's Software Works; and Keizo Shirai, a section manager with Nissei Electronics Ltd.

All four suspects allegedly participated in a scheme to buy top-secret IBM systems technology from FBI undercover agents and then ship the information back to Hitachi's home office in Japan.

Vion Sues FBI Over Contract Award

(Continued from Page 1)

Pappert accused the FBI of having acted "improperly" when it awarded its lucrative systems contract to IBM and cited at least three "conspicuous defects" that reportedly "render [the industry giant's] proposal nonresponsive."

One such alleged defect involves IBM's estimates of the proposed system's environmental costs. The Vion suit attacks the winning bid for allegedly understating the expense involved in meeting the proposed IBM hardware's power, water and cooling requirements, Pappert said.

Another reputed shortcoming in IBM's contract offer resulted from the failure of the company's processors to meet the FBI's million instructions per second rate requirements, the Vion president alleged. Pappert also accused IBM of making its systems available to the FBI under a payment plan that allegedly violates federal regulations.

In filing its law suit against the FBI, Vion reportedly seeks to overturn the bureau's recent systems selection and win the disputed computing contract for itself. In addition, the suit asks for a retraction of the FBI's original statement that the plaintiff's Hitachi- and NAS-supplied mainframes incorporate technology "improperly obtained" from IBM, Pappert said.

At the heart of the controversy is a multimillion dollar systems contract involving four large-scale processors that will ultimately be used in the FBI's National Crime Information Center for fingerprint identification and other investigative purposes.

Although Vion underbid IBM's $17 million systems proposal by about $1 million, IBM was eventually awarded the FBI contract anyway. At first, the FBI defended its controversial decision on the grounds that Vion's four proposed mainframes — an NAS AS/9000-2 and three AS/7000s — contained technology that Hitachi had allegedly stolen from IBM while participating in an industrial espionage ring.

But a little more than a week later, the FBI suddenly reversed itself and cited Vion's alleged inability to deliver Extended Architecture and Extended Feature Microcoding as the true reason for the contract loss.

Unwilling to accept either explanation without a fight, Vion last month filed a formal protest with the General Accounting Office and then promptly followed that action with its Aug. 4 lawsuit.

New Hires, DBMS High on List

Software Tops DP Wish Lists for 1983 Budget

CW Staff Roundup

If you did not have a single constraint on your 1983 budget, what would be at the top of your DP wish list?

Most of the 30 industry DP managers *Computerworld* surveyed last week would opt for more software. "I'd like to beef up our software to get into the information center concept — that software is quite expensive," said Greg Owen, DP manager at Magnavox Advanced Products Division in Torrance, Calif.

"[If I could have anything I wanted] it would definitely be in the applications software area . . . I'd like to replace all the old applications on the system and develop some new ones," offered Robert Campbell, manager of information systems at Sunkist Growers, Inc., Van Nuys, Calif.

"We'd buy more applications software if we could," commented Robert Taylor, vice-president of DP and communications at Continental Grain, New York City. "I'd also like more hardware . . . and grow the data center with more disk space."

"Definitely more applications development people . . . we suffer by comparison when it comes to productivity," maintained the DP director of a large New York broadcasting conglomerate who wished to remain anonymous.

"I'd like a data base, but I don't think the choices are that good," remarked Stewart Neill, vice-president of information systems and services at Saks Fifth Avenue in New York City.

Other wish-list requests included a point-of-sale system, additional personnel, more data base technology and more telecommunications capabilities.

Ken Shintaku, DP director for A&M Records, Inc., Hollywood, Calif., would like to increase his software and hardware, "mainly to be more productive . . . if we didn't have to hold back on disk use, we could have more freedom and do things faster."

Some of the executives put their wish lists into more abstract terms. Richard Blue, DP manager for TRW Systems Group in Redondo Beach, Calif., wants "excess capacity" that would enable him to "answer the problems of the users — whether real or imagined."

And "user demands keep increasing every year" for Robert Karp, director of DP for Girl Scouts of U.S.A. in New York City, who would look for "more personnel."

Robert L. Trenchard, vice-president of management information services for Columbia Pictures, also in New York City, would ask for "reliability and stability, more quality assurance, more people . . . applications developers and such."

And finally, one anonymous DP manager for a large Midwestern heavy-equipment manufacturer wistfully wished that "the economy would turn up."

DP Shops Feel Recession Pinch

(Continued from Page 1)

nies and paper and machinery manufacturers, where cost-cutting has been implemented in hardware, software and personnel expenditures.

Many companies contacted said they are moving ahead with plans to upgrade their hardware systems. For example, MCA, Inc. of Universal City, Calif., recently purchased an IBM 3081 mainframe. But nine of the firms surveyed are cutting back on planned hardware acquisitions for 1983 and one Midwestern firm is actually cutting two mainframes out of its current processing setup.

"We've seen delays in hardware acquisitions, especially in processing power," said one management information systems director at a California aluminum and chemical company. "Plans for new hardware keep getting pushed back."

"I think there will be growth in spending for hardware and software, but it won't be at present rates," Elaine Bond, senior vice-president of corporate systems for the Chase Manhattan Bank, predicted.

"We've eliminated two high-end CPUs completely and are making a 15% reduction in disk capacity over the next 24 months," said one executive at a Midwestern heavy equipment manufacturer. "We have consolidated several software systems in different parts of the company, choosing the best applications to implement on a companywide basis.

"Application activity in 1983 will be curtailed," the unnamed source continued. "We had a tremendous need for on-line capability and that is on hold."

Software expenditures will be limited in the coming year for 24% of the companies contacted. A cutback in productivity aids and enhancements was predicted by one New York grain company. And plans for some projects have been totally eliminated at the Brunswick Corp. of Skokie, Ill., according to the DP head there, Judith M. Bastion.

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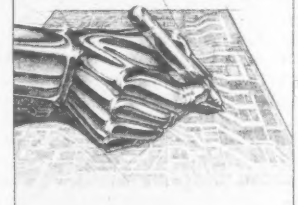

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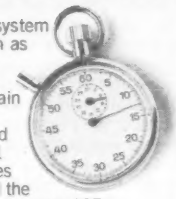

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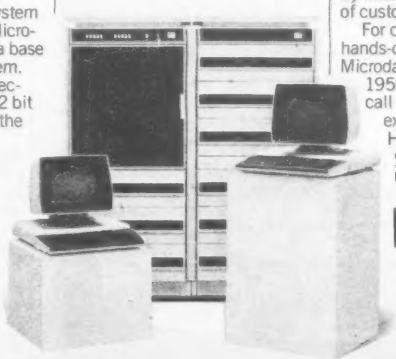

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Subcommittee Opposes Using IRS Files for Draft

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — A House of Representatives subcommittee is trying to stop the Internal Revenue Service (IRS) from using its computer files to enforce military draft registration.

The IRS-Selective Service plan "involves IRS in a matter wholly unrelated to its tax administration responsiblities at a time when budget cuts are forcing severe reductions in taxpayer services, taxpayer audits and other functions essential to the collection of all taxes due the government," Rep. Benjamin S. Rosenthal, (D-N.Y.), chairman of the House Goverment Operations Subcommittee on Commerce Consumer and Monetary Affairs told IRS Commissioner Roscoe Egger Jr. in a recent letter.

The Rosenthal subcommittee has called Egger to testify this Wednesday. A subcommittee aide said the panel will try to persuade the IRS to cancel its plans to help the Selective Service enforce compliance with the registration law. Additionally, the subcommittee wants to take up a number of issues relating to privacy and use of federal records, the aide indicated.

Earlier this year, the IRS agreed to supply addresses for hundreds of thousands of draft-age males suspected of failing to register [CW, May 17]. An IRS plan to mail letters to some 75,000 nonregistrants reminding them of the draft law's requirements has been postponsed at the request of Rosenthal, who asked for detailed information on the plans, operational procedures and costs of the IRS proposal.

Several Reservations

In his July 21 letter to Egger, Rosenthal expressed several reservations about the IRS plan: "It raises the spectre that the tax returns of recipients of your [draft registration] letter might receive special attention by the [IRS] at some future time and ... it seriously erodes taxpayer confidence in the privacy of their tax records and in the independence of the IRS, thereby jeopardizing our self-assessment tax system."

Rosenthal noted that voluntary tax compliance is decreasing while the underground economy is growing. "Abusive tax shelter and illegal tax protester schemes are on the increase" while the IRS faces a growing work load with aging computers, making it harder to examine any substantial portion of returns, Rosenthal said.

The subcommittee chairman also referred to the long congressional debate over making IRS records available to other federal agencies for enforcement programs, plans for which have long been fought by Congress and by previous IRS commissioners.

In light of that debate, Rosenthal called the IRS plan to aid the Selective Service "particularly troubling ... If IRS is used to secure compliance in the draft registration law, why should it not be used for compliance with the myriad other laws enforced by the Executive Branch?" Rosenthal said.

No Authority

Subcommittee Chief Counsel Theodore J. Jacobs told *Computerworld* last week the panel does not have the authority to order Egger to give up the draft assistance plan. But he said, "hopefully, we will have some persuasive information that may lead them [the IRS] to change their mind and hold off." The "persuasive information" he referred to was still being gathered, he added.

Conceding that the hearing comes at a late date in the planning for the draft enforcement exercise, which was first suggested several years ago, Jacobs said it is "very unusual" for the IRS to go ahead with such a plan "without specific legislative authority."

The subcommittee attorney said "a significant factor" prompting the hearing "is our concern with what we see is a chipping away of the Privacy Act in many areas ... One of our purposes in holding this hearing is to elevate this issue." For example, he said, "the use of Social Security numbers as a [personal] identifier is something the Privacy Act was meant to avoid, and yet you see that [prohibition] crumbling."

STC Scraps Plans to Market VSS

(Continued from Page 1)

close to the company speculated the firm probably did not have sufficient demand for the product to warrant putting it into production. Robert Stephens, vice-president of administration at Magnuson, reported orders from STC for the VCPs were minimal "and not an integral part of our business."

Moreover, there was an order of magnitude of effort still necessary to get the operating software to the point where it would perform at the level anticipated in the product specifications, said one source who asked not to be named. STC reportedly has already spent approximately $15 million on the VSS product and continued development would have required further significant investment, the source said. The company refused to comment on possible problems with the operating software. However, the company did say that the software development effort expended for the VSS project could be applied to other upcoming systems.

The VSS system was STC's entry into the total-systems market. "The idea was a good one, but it is not the type of product the company has built its reputation on," according to the anonymous source. STC is best known for its high-end IBM-compatible disk and tape products. However, the firm is now developing an IBM-compatible processor.

STC did have at least one successful beta test site for VSS, but the operation of that system was at "a minimal level of functionality," the observer continued. STC acknowledged the system had been beta tested, noting the Magnuson processor was working beautifully, but not reliably. The firm refused to comment on whether it had explored using processors from other IBM-compatible vendors or whether it had shelved the product to await the announcement of its own processor.

"In some people's mind's there is still a market for a back-end processor, but as far as STC's current implementation of the system it is not viable when compared to other products coming on-line," another industry observer said. The company's chairman and chief executive, Jesse I. Aweida, has made no bones about the firm's strategy of keeping tight reins on product development costs and changing directions if the product becomes too costly to produce or market.

In particular, STC is banking on its optical disk storage product that is scheduled for introduction in the next few months. The company has noted that the storage cost efficiency of its 4G-byte optical disk allows users to leave a lot of open space on the disk, the spokesman said.

Do You Need a Good Fullback?

(Continued from Page 1)

football. The service went into effect last month and offers statistics on more than 4,000 football players.

College recruiters can obtain the computer-generated report, which includes a table of contents listing the names carried on the data base for $750/year. The user can then obtain information from the Blue Chip data base either by providing a specific student name or by plugging in appropriate criteria such as "quarterback, 200 lb., more than 6 ft., wants to attend school in the South."

For $1/player, a recruiter can obtain an itemized account of each player's name, position, height, weight, speed in the 40-yard dash, hometown, high school, coach's name and grade point average.

For $2/player, the recruiting school can obtain a more detailed report, which includes information on aptitude test scores, religious and ethnic background, passing percentages, receiving statistics, coach's comments and geographical preference.

Ron Touchstone, executive director at Blue Chip, is the man behind the data base. His company has been publishing *Big Eight Magazine*, a preseason football magazine for The Big Eight Conference, since 1972.

Three years ago, the firm launched *Blue Chip Magazine*, which lists the nation's top-rated high-school players and the most recent national football recruiting results. Touchstone believed the computer offered a better way to deliver more immediate and specific information to recruiting colleges and launched the computerized program in 1980 with an initial mailing of 18,000 to all U.S. cities with football programs.

Given current technology, Touchstone claimed that a data base including information on players from approximately 18,000 high schools is feasible. His company has installed a Wang Laboratories, Inc. VS minicomputer system and enters 70 bits of information on each of the players. "It's not really a sophisticated idea," admitted Touchstone; "yet people always ask me why it hadn't been done earlier," he said in reference to the data base compilation.

We found out that recruiters were building individual data bases and spending lots of money on correspondences and travel to see various high-school players and coaches, he said. In 1980, we suggested they leave the paperwork to Blue Chip."

Touchstone predicted that the data base will be expanded to include college basketball and baseball prospects within a few years, and his company is also contemplating a similar service to include women's athletics. He suggested that the dilemma of deficit financing in women's college sports is partially due to an inability to locate talent that would really draw in fans.

The Blue Chip Bureau data base could alleviate that problem, he claimed.

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Business Orientation Needed

MIS Exec Finds College DP Training Lagging

By Robert Batt
CW West Coast Bureau

LA MIRADA, Calif. — College students specializing in data processing are not being properly prepared for life in a business environment, a senior management information systems (MIS) executive has claimed.

Evan Wride, manager of employee systems at Denny's Inc., said colleges are always behind the times in terms of technology, with many of them refusing to recognize IBM's premier position in the marketplace.

"Even though application subsystems such as IMS and CICS are over 10 years old, they are still often not taught," he said. "This is because colleges do not wish to promote IBM products; but when they possess 85% of the market, students need to know about such packages."

Most Important Factor

Wride argued that the most important factor in dealing with software was for DPers to get out and evaluate user requirements and establish a rapport with the customer. "But this is not stressed in colleges. Students are often not prepared for the kinds of interaction that has to take place. They don't understand how a business works and think things are more black and white than they actually are."

Wride, who teaches a course about managing computer technologies in the '80s at the University of California at Los Angeles, said employers today are looking for students with more of a business slant than simply a DP background. The college curriculum, he argued, should prepare the student for the business world rather than just the technicalities of DP.

Courses, he said, should be more practically based. One way to achieve this is to increase links between colleges and industry, with industrialists taking the initiative and actually calling colleges and offering to teach classes, he suggested. Wride said it is no longer acceptable for senior DP executives working in industry to claim they don't have the time to teach. "If we are to have the people we want, we are going to have to make the effort to do this," he added.

Wride claimed that teachers who have current daily practice in the MIS field are able to adopt a more realistic stance than someone who is embroiled in purely academic work: "If all you have ever done is teach, the students are going to get a lot of philosophical stuff and when they come into the field they find a totally different reality and only 5% to 10% of what they have learned is applicable."

Wride was also quick to point out the virtues of a college- or university-based education, stating that Denny's has made it a mandatory requirement that anyone holding a position in MIS at the level of systems analyst and above should have a four-year degree.

The question facing both industry and academic institutions, he asserted, was how to structure courses that reflect the reality of the DP world and give the students a better deal. He suggested a number of ways in which this could happen:

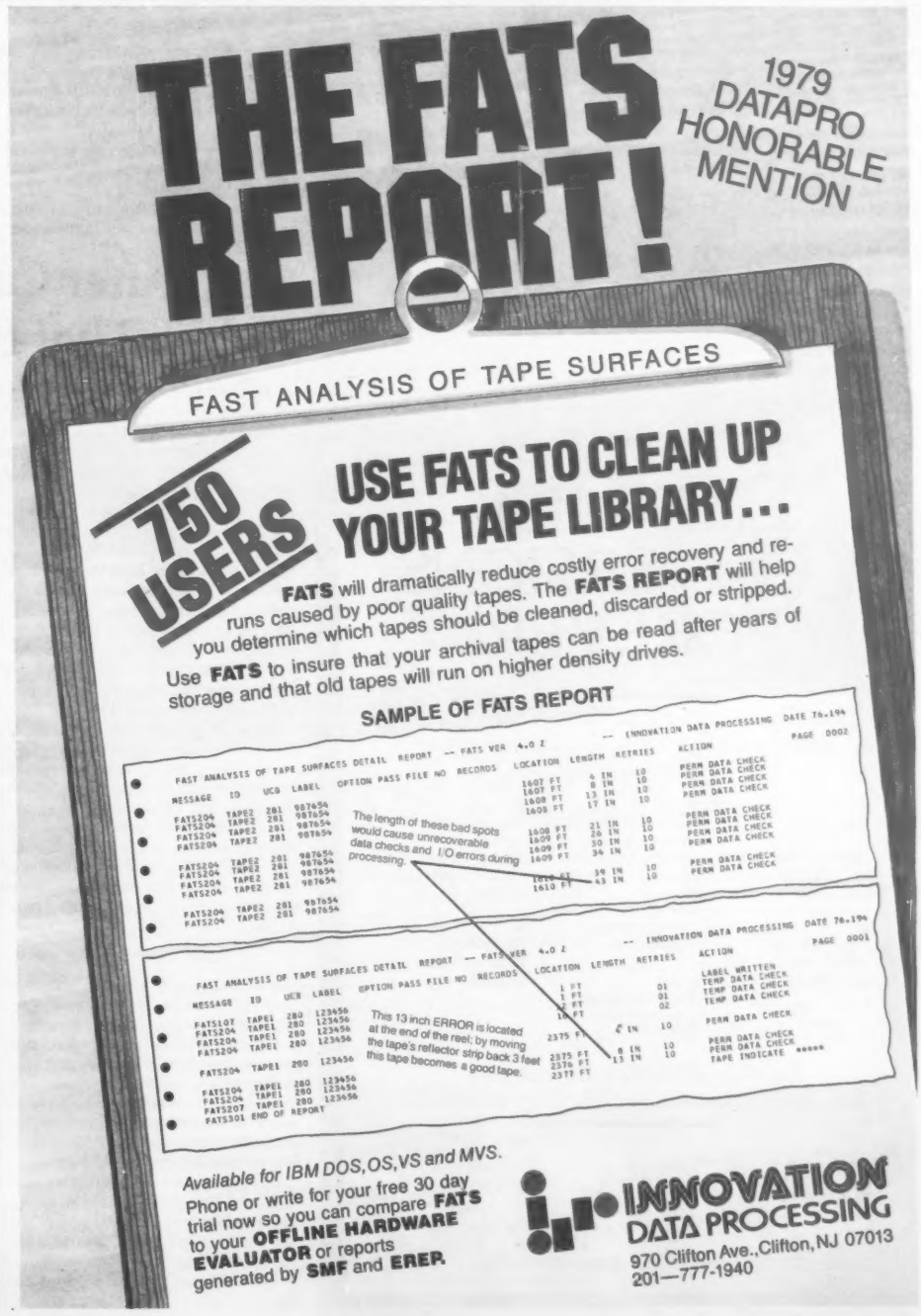
- Academics should be given the opportunity to work a part of each year in the business environment in order to familiarize themselves with current technological developments and business practices.
- DP instructors with practical experience can serve students better, and so it should be a requirement of educational institutions that they hire people with an industry background.
- Very few academic establishments invite outside specialists to speak on specific topics such as office automation, data base management systems and developments in communications technology. There is a lot of potential to develop this aspect of academic/industry cooperation, Wride maintained.

"By applying some of these suggestions there is no doubt that the quality of teaching will improve. If, as a teacher, you have practical experience and can give examples of problem solving from your own working life, it makes the class that much more alive and students relate to the subject matter better."

Wride also urged the promotion of internships where the student works for an employer as part of his course work and obtains units of academic credit in return. This has the advantage, he claimed, of giving the students practical experience concerning how to use what they learn in the marketplace.

He concluded: "There is a critical shortage of good DP people. It is vital that there be an exchange of information between academics and industrialists evolving over time. Industrialists should take the lead in contacting the deans of colleges."

Wride warned that without such an initiative the DP shortage will continue indefinitely, the quality of students will continue to be bad and colleges will continue to drop further behind in technology.



Efficient Phone Calling Makes Its Mark

'This Is a Computer — Have You Paid Your Bill?'

By Jim Bartimo
CW Staff

"Hello, this is a computer speaking."

That was the greeting Massachusetts resident Joyce Furia received when she picked up her telephone recently. Furia was the target of one of a growing number of telephone campaigns that involve computers.

Telephone marketing and collection has been in existence for years, but now the computer is being introduced in a number of ways. In the past, a caller would read the sales pitch or survey from a script, noting the answer of the respondent. A follow-up letter might be sent to reinforce the pitch or remind the respondent that his bill was due.

Now, computers are dialing, responding or recording the responses in a number of different combinations. For instance, Telecomputer Business Systems, Inc. of Quincy, Mass., employs 10 to 20 operators to introduce a taped message that prompts the respondent and records the answer. The message continues only when the respondent has completed his statement, according to Raymond Girard Jr., vice-president for marketing and sales.

"I can make 3,000 calls an hour and give you a computer readout on the responses," Girard said. "The responses are coded and recorded. We will eventually have the computer do the dialing."

After introducing the message, the operator is able to make more calls as the first person listens to and answers the recorded message. Depending upon the wishes of the client paying for the service, a letter may be printed out by the Wang Laboratories, Inc. system outlining what was discussed in the message.

Micro-Based Dialer

The microprocessor-based automatic dialer is another method introduced to the telephone call. Telephone Broadcasting Systems (TBS) International, Inc. of Richardson, Texas, has developed a system, the TBS 9000 Telecomputer, that can make 200 calls per hour. "If the line is busy, it calls back every five minutes. If no one is home, then it calls back later in the day," according to Jack Heinritz, vice-president of creative service.

The $150,000 units were used by former president Jimmy Carter in his 1980 bid for the presidency and by Texas evangelist James Robison for fundraising, according to Skip Cave, vice-president of engineering for TBS. The company will also write a script to be read by such stars as Danny Thomas and Zsa Zsa Gabor.

"There are two methods of storing the responses," Cave said. "We have an analog tape recording of what was said and a digitized record of what was said in the conversation on a floppy disk."

"You can rent lists of phone numbers from a number of list brokers," Heinritz said, including the publishers of the Yellow Pages and magazines and from registries of motor vehicles.

Market Resources International, Inc. uses home-grown software and a Wang Laboratories VS 100 with 1.5M bytes of main memory and 1.5G bytes on disk to both prompt its callers and keep track of the respondents' answers, company President Bernie Goldberg said. An operator reads the customized script from the display screen and then feeds the answers back to the computer.

Programmed Response

If a respondent gives a "yes" answer, the computer program will display a different follow-up question than if the respondent had said "no." The interview is essentially conducted by the program, which requires 50 screens and up to 11,000 lines of Cobol, Goldberg said.

Why is the operator only a middleman between the equipment and the potential customer? "We do work for Rolm [Corp.], Xerox [Corp.] and ITT," Golberg said. "How could you train a caller [to ask the right questions] in all those businesses?"

Many market research firms, collection agencies and sales forces have implemented the computer mainly to cut costs. "A single sales call rose to $178 in 1981," according to Goldberg, whose firm specializes in sales. "The computer industry is struggling with this sales cost more than anyone else. A manufacturer spends upwards of $2,000 per order, just to find [a potential customer] — not to sell — just to find someone."

"Ninety percent of my business is for collection for large utility companies," Girard said. "To hire enough people to call the thousands and thousands of people who don't pay their bills would lead to a high overhead."

Will computerized telephone marketing outstrip other forms of advertising as computers make calling faster and faster? Joyce Furia hung up before she even heard what the computer had to say.

Computer Calls Confront Public That Prefers People

"It's kind of scary to be called by a computer," according to Tom Ramsburg, vice-president and general manager of the market research firm Centrec, Inc. "In the research industry, we have to be careful of the people who are doing the calling. I think people want the human contact. The computer is still gimmicky.

"You sometimes have to give a response to the computer before the connection is broken," Ramsburg said. "I've heard stories of a medical emergency coming up where an ambulance had to be called and the phone connection couldn't be broken until there was a response."

"We were instrumental in filing recorded-message legislation in California," Jack Heinritz, vice-president of Telephone Broadcasting System International, Inc. said.

The legislation called for respondents to be able to break the connection and messages to be introduced by an operator. "There are seven states that have passed such laws." he said.

Nixes Auto Dialing

Lawrence Steinberg, president of Mar-Tel Communication, Inc. — a marketing firm — also objects to automatic dialers and prerecorded messages even though they use computers to log responses. "Automatic dialing is for mass distribution; we don't do anything like that at all," he said. "It locks you out. People don't like to talk to a machine."

A major department store uses automatic dialers and recorded messages to notify their catalog customers that their orders are ready, according to Raymond Girard Jr., a vice-president at Telecomputer Business Systems, Inc.

"It clicked on at midnight one time," he said, rousing a number of sleepy customers to notify them that their orders could be picked up.

"I think the phone is underconsidered," Girard said, noting that "You immediately pick up the phone whether you're in the shower or making love to your wife. You can't [get that kind of audience] with the T.V. or radio."

ADR '82 to Hold Fall Dallas Meet

SECAUCUS, N.J. — Cadre '82, the Applied Data Research, Inc. (ADR) products user group, has announced it will hold its annual meeting in Dallas this fall.

The conference will feature John McClure of the American Productivity Center as its opening speaker. This is in line with the five-day seminar's theme of "The Productivity Challenge," according to a press release from ADR.

Also slated to be featured at this year's meeting will be B. Gentry Lee, a partner with Dr. Carl Sagan in Carl Sagan Productions, Inc.

Cadre '82 will be held Sept.19-23 at the Hyatt Regency Hotel in Dallas, Texas.

An information packet will be mailed in June to all ADR product licensees. A registration form will be mailed shortly thereafter.

The registration fee for the conference is $295 until Sept. 1 and $325 thereafter. Further information can be obtained from Karen Gardner, ADR Cadre Director, Panasonic Co., One Panasonic Way, Secaucus, N.J. 07094.

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Survey Finds More Women Opting for DP Careers

By Susan Blakeney
CW Staff

CHICAGO — A growing number of women are choosing careers in computer programming and technical management, according to the results of a recent study by DeVry Institute of Technology here.

Based on a poll of 100 DP firms in the Chicago area, the average increase in the number of women going into DP during 1981 was 20% over the previous year.

Respondents also revealed that women are generally willing to take entry-level jobs. At the other end of the spectrum, women are finally making their way into management because of this push from the bottom up. Some respondents maintained that the number of female applicants has always been high and reported no significant increase during 1981. Others cited a shortage of female applicants, but were eager to hire them when qualified.

The vast majority of companies queried (81%) indicated that Cobol is the most desirable computer language for an entry-level applicant. They also concurred on giving preference to four-year college or university graduates, with 69% wishing to hire college graduates, and the remainder split over two-year community college degree holders and technical school graduates.

Skills vs. Education

In order of importance, possession of specific skills was deemed a more important qualification for the interviewee than educational background. Previous part-time experience and personal appearance trailed after education.

Asked if women interviewees were well prepared to discuss technical equipment or procedures, 51% replied in the affirmative and 23% responded in the negative.

More than half of the firms surveyed said that women began the interviews with specific job goals in mind. However, only 35% of these respondents indicated that the applicants were able to discuss methods of achieving these goals.

Also, 42% of the firms said women applicants were poorly prepared to discuss the computer industry at their first interview, and 39% said they were "adequately prepared" for this type of discussion.

In addition, most survey respondents reported a naive or unrealistic view on the part of the applicants with regard to the industry.

The majority of companies surveyed also predicted a continued increase over the next few years in the need for entry-level programmers, computer programmers, system analysts and people in the area of management.

DeVry Institute of Technology is a member of the Bell & Howell Education Group, a network of institutes specializing in electronics and computer science for business education. Copies of this survey are available free from Bell & Howell Education Group, Inc. at 2201 W. Howard St., Evanston, Ill. 60202.

Report Targets DPers Planning Expansion

DELRAN, N.J. — Datapro Research Corp. is offering a report for DPers who plan to build or expand their computer center.

Called *All About Computer Room Environment*, the report covers various design issues including physical layout of the computer center, expanding an existing location, power considerations, security breeches and purchasing new hardware, Datapro said.

The report costs $19, the firm said from 1805 Underwood Blvd., Delran, N.J. 08075.

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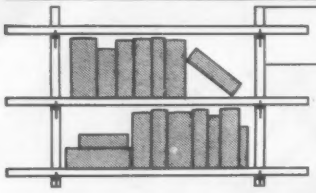

Off the Press

SOFTWARE ENGINEERING: A Practitioner's Approach
By Roger S. Pressman

This book describes what the author calls the *software crisis* of rising software development costs, problems with timely delivery and quality control within the context of a careful, coordinated set of techniques called software engineering. Paralleling the software life cycle, each chapter chronicles the process, such as planning, system definition and requirements analysis. Managers will appreciate the material on planning, estimation, documentation, review, guidelines and maintenance. Many illustrations, diagrams and references.

Hardcover, 352 pages, $32.95, ISBN 0-07-050781-3. McGraw-Hill Book Co., 1221 Ave. of the Americas, New York, N.Y. 10020.

PRINCIPLES OF EDP MANAGEMENT
By Alexander Gaydasch Jr.

Here's a thoughtful, lively overview written with the working manager and would-be manager in mind. Key chapters include planning, systems development for management, personnel management, sources of DP services, financial and legal considerations, auditing and the future of DP management. The author shares keen insights and earthy pragmatism throughout; for example, "individual people, not formal structures or job descriptions, ultimately determine organizational relationships," or "how can a leasing company buy and then lease hardware cheaper than the original manufacturer? The answer lies in market forces, tax laws and specific terms." Glossary, index.

Hardcover, 334 pages, $19.95, ISBN 0-8359-5604-0. Reston Publishing Co., Reston, Va. 22090.

TESLA: Man out of Time
By Margaret Cheney

"I do not think there is any thrill that can go through the human heart like that felt by the inventor as he sees some creation of the brain unfolding to success . . . Such emotions make a man forget food, sleep, friends, love, everything." So said Nikola Tesla in 1896, who was first to harness the energy of alternating current, who invented the radio, fluorescent lighting and bladeless turbine and predicted that wars in the future would be fought by remote-controlled machines and robots. This is a biography of a flamboyant yet little-known man. Tesla, who lived from 1856 to 1943, was born in Yugoslavia, but was a long-time resident of the U.S. He contributed to the development of computers, robots, telemetry and nuclear fusion. This fascinating biography covers his work, his life in New York as a bon vivant and his many friendships and associations.

Hardcover, 320 pages, $16.95, ISBN 0-13-906859-7. Prentice-Hall, Inc., Englewood Cliffs, N.J. 07632.

TELEMATICS AND GOVERNMENT
By Daniel Schiller

Schiller posits in this informed and frank book that not only has the U.S. government supported telematics — the combination of telecommunications and computer technologies — but has in fact shaped and steered it, with 30 years of deliberate policy decisions and contract awards. Part One begins with post-World War II policy and studies many precedent-setting legislative decisions. Part Two explores the transnational sphere, specifically the relations between Canada, Western Europe, Japan and the U.S. Part Three covers the U.S. government's role as a market and as a market-driving force in telematics development in private and public sectors. A well-considered, well-documented work.

Hardcover, 237 pages, $24.50, ISBN 0-89391-106-2 (Paperback $12.50). Ablex Publishing Corp., 355 Chestnut St., Norwood, N.J. 07648.

SHORT TAKES

A GUIDE TO NOMAD FOR APPLICATIONS DEVELOPMENT
By Daniel McCracken

This is a careful tutorial on using Nomad, a relational data base management system, for application development.

Paperback, 220 pages, $17.50, ISBN 0-201-04624-5. Addison-Wesley Publishing Co., Reading, Mass. 01867.

A GUIDE TO DP TRAINING COURSES
Edited by Jocelyn W. Franklin and Roger Sullivan

Describes over 350 training courses in detail, organized by topic (data base, systems analysis, user training, management and so on). Supported by periodic supplements as new courses are offered.

Loose-leaf binder, 357 pages, $95.00, ISBN 0-914234-61-7. Order from Human Resource Development Press, 22 Amherst Road, Amherst, Mass. 01002.

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Form Nonprofit Recovery Group

Banks Find Safety From Disaster in Numbers

By Lois Paul
CW Staff

HYATTSVILLE, Md. — Recognizing that there is safety in numbers, a group of 10 banks in the general Washington, D.C., area have formed a separate nonprofit organization to work on disaster recovery plans.

This assistance includes everything from sharing ideas and concepts in the planning stages to providing people, space, equipment and logistical support in the event of an actual disaster, according to Ross Markley, president of the Bancon group. Markley is also assistant vice-president for operations and the data center manager for Suburban Bank in Hyattsville, Md.

Bancon was formed in May 1980 in response to the growing concerns about disaster contingency among its member banks, which range in size from $150 million to over $3 billion in deposits, Markley said. "We all felt helpless individually," he added.

Capturing Checks

The requirement to "capture checks" sets banks apart from other organizations when it comes to contracting for disaster recovery services, Markley explained. "It cannot be done manually, and that is really what brought us together."

Therefore, the initial goals of Bancon revolved around the processes of check encoding and check capture. Check processing begins when a cashed check is returned to the depositor's bank. To balance it, the bank uses equipment that magnetically inscribes the transaction code and the amount of money for which the check was drawn in the right hand corner of the check. Once this is completed, the check is read through magnetic ink character recognition (Micr) equipment. Information such as the account number and process code is recorded on a disk for use in updating the depositor's account.

Markley said his bank alone processes half a million checks a day. "Without that ability, I can't update anybody's account. I can't do anything. I am in a lot of serious trouble."

Bancon members initially had considered pooling resources to set up a shell facility that would be environmentally prepared for use as an alternative data processing center, in the event of an emergency. Markley said this idea was set aside when members realized that the costs involved would be prohibitive. Instead, they concentrated on proof and enscribing or encoding backup.

In addition, a number of Bancon members have separate disaster recovery plans through contracts with companies such as Sunguard Services, a subsidiary of Sun Oil Co. Markley's bank is one of these.

Check Processing

The Bancon organizers also had considered acquiring an IBM 3890 Micr reader/sorter that could be commonly used for capturing checks. This was shelved, he said, because it would be difficult to have one system with all of the features required by the various banks.

Instead, Bancon worked with Viable Information Processing Systems, Inc. of Towson, Md., which developed the Survival Check System, a utility check processing package designed to enable banks to process their checks on another bank's IBM 3890 under emergency conditions. Three of the current Bancon members have installed this software.

In addition, Bancon members have drawn up an agreement whereby they will share their encoding equipment between certain hours if a member bank suffers some setback. "From there, it is up to [it] to have the computer process backed up, which would be along the lines of a Sunguard or service bureau or a buddy down the street," Markley said.

Bancon is run entirely by its member banks, each of which has appointed a representative to serve on the organization's board of directors. The directors hold a business meeting the third Thursday of every month.

A current Bancon project is the development of a disaster assistance task force whereby a member experiencing a "traumatic situation" can call a Bancon officer who will convene an emergency meeting. "You tell us what kind of assistance you want and we are going to be there to provide that," Markley said. "What we want to do is provide level-headed advice and guidance."

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Managers on the Move

MELISSA CIMABUE has been named vice-president of systems and administration for Ibis Systems, Inc., in Duarte, Calif. Her responsibilities include management information systems (MIS), human resources, administration and facilities management.

Melissa Cimabue

Previously, Cimabue was a consultant and a manager of industrial relations of the video, word processing supplies and flexible disk media divisions of Memorex Corp. Prior to that she was a labor relations and equal employment opportunity specialist with Gates Rubber Co.

She holds a B.S. degree in social welfare from San Diego State University.

•••

ARNOLD M. LANG has been appointed corporate vice-president of Balanced Foods, Inc. in Ridgefield, N.J. He will be responsible for MIS and telecommunications throughout the country. This includes planning, systems and program development, hardware and software selection, computer operations, as well as voice and data communications within the corporation and with its customers.

Prior to joining Balanced Foods, he was internal business systems consultant for General Instrument Corp., and prior to that he was project manager for financial systems at Thomas J. Lipton.

•••

KEVIN E. DUHAMEL, vice-president, has been appointed manager of financial delivery systems for NBW, a division of Lincoln First Bank, N.A., based in White Plains, N.Y. He will be responsible for the entire New York State network of delivery systems for the first banking divisions of Lincoln First Bank. This will involve changing all delivery systems to include the evaluating and implementing of an automatic teller machine network and an automated information delivery system for tellers and personnel and coordination of the Plus system.

Upon joining the division, Duhamel served in various branch management positions and later was assigned the teller automation project. He has since assumed various data processing management responsibilities and was named manager of the New Rochelle Computer Center.

He earned an associate's degree from the Phoenix Art Institute and is a graduate of the Stonier School of Banking at Rutgers University.

Kevin E. Duhamel

•••

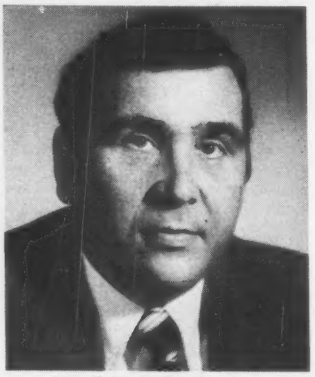
NORMAN H. LEIBSON has been named first vice-president in automated data processing at Security Pacific National Bank in Glendale, Calif. In this capacity, he will continue to direct the telecommunications department in the bank's 3,000-plus ADP Group.

He joined the bank as a senior financial analyst and transferred to the Information Systems Division the following year. He later was promoted to manager of interactive computing and subsequently was named a vice-president and division manager.

Leibson earned an M.S. in business administration from California State University in Northbridge.

•••

JOHN F. GASSLER, manager of software systems, has been elected assistant vice-president at NBW, a division of Lincoln First Bank, N.A..



John F. Gassler

He joined the company as manager of the New Rochelle Systems and Programming Department. Prior to joining the bank, he was manager of systems and programming at Helmsley Spear, Inc. in New York and held various DP positions with Automated Concepts, Inc., the Plaza Hotel and the Great American Insurance

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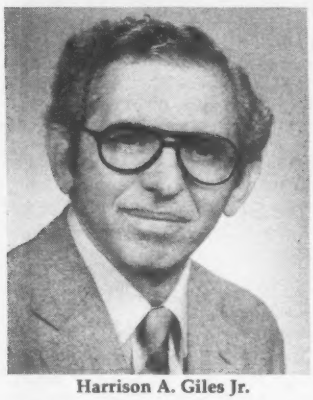
Gassler holds a B.S. degree in mathematics and an MBA degree in management systems from Iona College, New Rochelle, N.Y.

•••

HARRISON A. GILES JR. has been promoted to senior vice-president at North Carolina National Bank which is headquartered in Charlotte, N.C. He will continue as manager of the Planning and Major Development Department in the Systems Support Division.



Harrison A. Giles Jr.

He joined the bank as a technical support manager in the Systems Department and has held positions with the bank as manager of technical support and director of the systems development and the systems and programming departments.

Giles earned a B.S. degree in nuclear engineering and a B.S. degree in applied mathematics from North Carolina State University. In addition, he earned an M.S. in applied mathematics from the same institution.

•••

ROBERT G. GAILLARD, manager of software systems, has been named an assistant vice-president at NBW, a division of Lincoln First Bank, N.A.

He began as a systems analyst/programmer with the bank. He later was promoted to manager of systems and programming and systems officer and subsequently became supervisor of software.

Robert G. Gaillard

He holds an A.A. degree from Daytona Beach Junior College and an Advanced Certificate from the American Institute of Banking.

•••

RICHARD J. THOM has been promoted to vice-president of the New Rochelle Computer Center at NBW, a division of Lincoln First Bank, N.A. He is responsible for the systems and programming, computer operations, systems software and production control functions which support the NBW and the division.

Richard J. Thom

Before joining the bank, Thom was assistant vice-president of computer services with National Bank of North America, and prior to that he was manager of computer operations with Union Mutual Life Insurance Co.

He is a member of the Data Processing Management Association.

•••

BASANT K. MEHRA has joined Energetics, Inc. in Englewood, Colo., as director of MIS. He is responsible for the planning, organization and management of all activities related to the information processing and handling environment. His responsibilities include providing support in the area of systems and programming, computer operations, data communications, word processing and microcomputers for the company.

He has had a wide range of management experience in directing, planning, designing, controlling and implementing major information systems, information resources management concepts, standards and policies in multidivisional business environments in Canada and the U.S. since 1967. Primarily, his experience has been with oil and gas, mining and manufacturing organizations.

Mehra received his B.E. degree from Rajasthan University, India, M.S. degree from Queen's University, Canada, and an MBA degree from East Carolina University.

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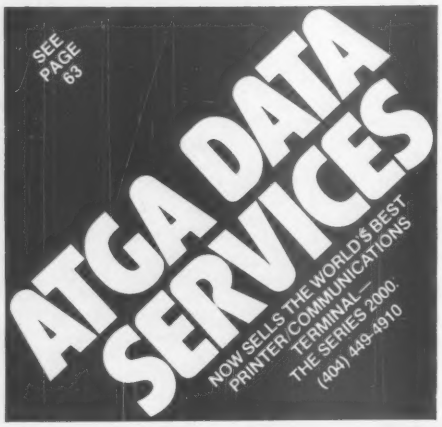

Inefficient Use of Graphics Seen Hindering Acceptance

By Marcia Blumenthal
CW Staff

BOSTON — Inefficient use of business graphics systems and computer-aided design and manufacturing (CAD/CAM) products is a major stumbling block hampering the acceptance of these products.

That was the theme expressed during a forum featuring the presidents of several graphics firms staged at the Association for Computing Machinery's annual Siggraph '82 graphics conference held here last month.

The issue is not how long it takes to learn how to use the system, but how to reach the level of productivity promised by the vendor, observed graphics consultant Carl Machover, president of Machover Associates, who chaired the session. Right now, the learning time to reach that point is six to 10 months, Machover said.

Challenge for Vendors

The challenge for vendors is to design products that are easy to use and to teach users how to make intelligent use of automation to make their jobs easier, said Donald Feddersen, president of Applicon, Inc. The use of automated techniques must result in the percentage labor comprises of the gross national product so the manufacturing cycle can be shortened. "If we demonstrate we are aiming to cut manufacturing time, then we are great, but if we don't, we are the biggest bums of the century," he exclaimed.

The difference between sales pitches and the actual usage of features of CAD/CAM and graphics features raises the integrity of graphics systems, Machover said. Enlarging upon this theme, one conference attendee accused graphics vendors of "overselling" their products.

One of the chief reasons users resist buying commercial graphics systems is they think they cannot operate these systems, maintained Peter Preuss, president of Issco Graphics. When compared to the usage of office automation systems and electronic mail, the use of business graphics is dismal, Preuss said.

Currently, there are about 300,000 individuals who use business graphics in a serious way. And the use these individuals make of graphics systems is unevenly distributed, Preuss observed, noting graphics may be used by one out of 10 people in one company, while in other companies usage may be confined to "three gurus in a computer center playing with it whenever there is an urgent need."

Technology Change

At the same time that graphics and CAD/CAM vendors are grappling with making systems easier to use, this part of the industry is in for major changes, the chief executives charged.

"The rapid change in technology makes the concept of vertical integration in the industry a death-wish strategy for turnkey vendors," maintained Ralph T. Linsalata, president of Lexidata Corp.

Rapid changes in display technology along with the need to address questions of communications and data base management are complicating the environment for vendors in the graphics industry, he said. Large firms such as General Electric Co., Schlumberger and IBM are in the field and "they are not insignificant." Morover, other smaller vendors such as Prime Computer, Inc. are marketing CAD/CAM systems and these vendors also have experience with communications and data base management systems.

Richard N. Spann, president of Adage, Inc., predicted a major consolidation in the graphics and CAD/CAM industry.

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Triples Savings Expectations

Michigan Tightens Food Stamp Belt On-Line

From Sept. 1, 1981 to Feb. 28, 1982, Estimated Savings For Wayne County's On-Line Food Samp Program

$	225,000	.... Lowered Transaction Fees
	200,000	.... Postage
	6,000	.... Paper
	60,000	.... Clerical Staff
	1,800,000	.... Projected Fraud Savings
$	2,291,000	.... Savings Before Payback
	-560,000	.... Cost of Equipment & Development
$	1,731,000	.... TOTAL Savings for First Six Months

LANSING, Mich. — An on-line food stamp system that was expected to save $500,000 a year has saved the state of Michigan $1.7 million in the first six months in one county alone.

Wayne County, Michigan's largest, formerly operated its food stamp program on a paper system. Each month, the central system produced and mailed a paper authorization card to each client.

"If the paper card was lost in the mail, stolen from a mailbox or lost by the client, real hardship could occur and the possibility of fraud would increase," explained David Wigent, deputy director of the Office of Food Programs in the Department of Social Services.

Food stamp vendors — a combination of U.S. Post Offices, private-sector food stamp centers and food stamp/check-cashing services — found the paper system "unwieldy, time-consuming and unpleasant for both client and vendor," Wigent said.

With 47% of the state's caseload, Wayne County was serving approximately 176,000 households at a cost of $1.42 per transaction prior to automation. By 1981, the state had prepared a request for bids to vendors and a federal planning document to obtain 75% matching federal funds.

"When the bids came back it was clear that the requested system was too expensive," Wigert recalled. One bidder, Burroughs Corp., suggested that a requirement for full video display be dropped and proposed instead a simpler, less expensive but equally effective system, he said. After a rebid, the project went to Burroughs.

Problems Overcome

Problems of software interface with the state's Honeywell, Inc. Level 66/DPS-5 host computer were also overcome by a joint effort when Burroughs worked with the state's technical support staff at the Health and Welfare Data Center to modify Burroughs' Network Definition Language into a workable handler, Wigert said.

The system went on-line Sept. 1, 1981. It automatically checks eligibility, generates an authorization card and posts each food stamp transaction in the host computer. Each of the 31 food stamp sites in the county is equipped with at least one Burroughs TT650 transaction terminal and one 90 char./sec Burroughs AP310 tabletop printer.

Plastic cards supplied by Burroughs are embossed and encoded at the central site here with the food stamp client's name and case number. Information from the card's magnetic stripe is read by the transaction terminal, translated by a modem at 800 bit/sec and transmitted at 1,800 bit/sec over four-wire, full-duplex, conditioned lines to the Honeywell, Inc. computer, Wigert explained.

There the host checks the request against the client's stored record and issues an authorization or denial. Authorizations, if given, print out on the AP 310 back at the food stamp site. The client then signs the authorization and is given food stamps in return.

"Since the computer logs each transaction, clients cannot obtain an additional authorization at another food stamp center during the same month," Wigert pointed out. Receipts are stored on-line for one year and off-line for an additional three.

"The entire transaction takes only seven seconds to process, down from 12 seconds when the system was introduced," Wigert noted. In addition, the switch to computers made private vendors more willing to bid on food stamp services and the cost per transaction has dropped from $1.42 to an average of $1.02.

Since its success in Wayne County, Michigan has expanded the system to Genessee County, with plans to fully implement the program in 15 additional counties by the end of the year.

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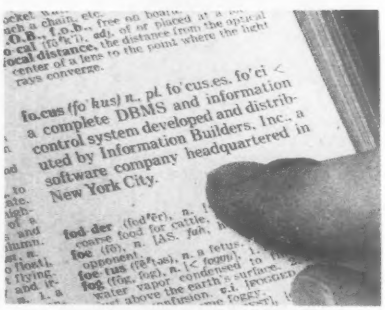

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Fire Fighters Combat Lightning With Computerized Detection

By Robert Batt
CW West Coast Bureau

SACRAMENTO, Calif. — The U.S. Bureau of Land Management has declared war on lightning strikes in the state of California through the use of a computerized detection system.

The system uses a Hewlett-Packard Co. HP 9845B desktop computer to monitor lightning strikes throughout most of the state. First devised in Alaska, the system monitors lightning strikes and in microseconds transmits their times and locations to bureau headquarters.

This information is then transmitted to fire agencies around the state and is used to direct reconnaissance aircraft to the scene, said Marjorie Andreco, the detection technician in charge of the project.

Fires caused by lightning account for 55% of the fires that occur on land owned by the bureau. The cost of putting them out varies between $1 million and $2 million a year. "We can save millions of dollars by using this system to detect fires at an early stage and therefore cut the costs of putting out the fires, reforestation and the recovery of areas badly damaged by fire," Andreco said.

The system itself is fairly straightforward. Sensors located at key points around the state scan for positive electrical charges emitted when lightning hits the ground. The computer plots the intersection of signals from two direction finders and the data is displayed on separate computer terminals covering the northern and southern parts of California.

Latitude and longitude readings accurate to a mile are pinpointed on a 10-in.-square map and dispatched to the reconnaissance flights, which normally scan an area of between 200 and 400 square miles. The whole process takes about five minutes. The information can also be used to reposition fire-fighting forces on the ground.

Currently, a test site has been set up by the bureau in Oregon to try out expanded capabilities of the system. In the future the system will be able to tell fire managers not only the times and locations of strikes but also what type of land is being affected, its gradient and the type of vegetation growing there — what technicians refer to as fuel type. This will enable fire fighters to assess more accurately the severity of the strike and how rapidly the fire is likely to spread.

In addition, the bureau is now expanding the system to issue its maps of lightning strikes to agencies like the federal forest and park services, state fire units and some county departments.

"This information augments the look-out program of the bureau and gives fire managers an additional set of tools for doing their jobs," Andreco claimed.

College Requires Students To Purchase Atari 800s

By Susan Blakeney
CW Staff

HOBOKEN, N.J. — Freshmen entering the Stevens Institute of Technology here who plan to study computer science, systems planning or management will be required to own a personal Atari 800 computer system, according to school officials.

Called the "Personal Computer Plan: Education for Tomorrow with Today's Technology," the new approach is aimed at increasing students' understanding of traditional subject matter and developing computer literacy.

Dr. Peter Jurkat, director of systems planning and management curricula and professor of management science at the institution, said the policy will allow students to have "constant access" to a computer system, and be "completely computer literate" upon graduation.

Jurkat explained that a six-member faculty committee decided upon Atari 800 microcomputers because of the machine's capabilities along with it's price tag of under $800. Asked if there had been adverse reactions to the financial burden here posed, Jurkat said that he not heard any complaints.

In fact, 20 engineering students who were not requireed to buy the small computers did so anyway. "They said they were looking to buy one anyway; they just needed an excuse," Jurkat maintained

The students at Stevens Institute already have access to a Digital Equipment Corp. System 10 and a DEC PDP-11. The microcomputer policy is intended, according to Jarkot, to round out their computer expertise.

The microcomputer policy goes into effect in September.

UCC User Meet Opens Sept. 19

SAN ANTONIO, Texas — University Computing Co. (UCC) will host its annual conference for users of its financial industries software here Sept. 19-22.

The keynote speaker for the meeting will be Robert D. Weber, president of Bob Weber Associates, who will speak on "Management of Human Assets," according to a release from UCC.

The conference will feature multiple sessions on various aspects of UCC's financial industry software products. The sessions will be conducted by UCC management and clients.

The registration fee before Aug. 31 is $485; after that it is $575, UCC said from UCC Tower, Exchange Park, Dallas, Texas 75235.

Smis Conference Slated Sept. 20-23

CHICAGO — John Diebold will keynote the Society for Management Information Systems' (Smis) 1982 Annual Conference scheduled here Sept. 20 to 23.

The conference consists of three days of sessions followed by a two-day workshop. The theme of this year's conference is "Strategic Planning and Information Management." Diebold will address the requirements for meshing the information systems strategic plan with the corporation's strategic business plans.

The session segment of the conference costs between $320 and $550, depending upon registration status; workshop costs range between $200 and $325; both events run from $420 to $900; and group discounts are available. Further details can be obtained from Smis at 111 E. Wacker Drive, Chicago, Ill. 60601.

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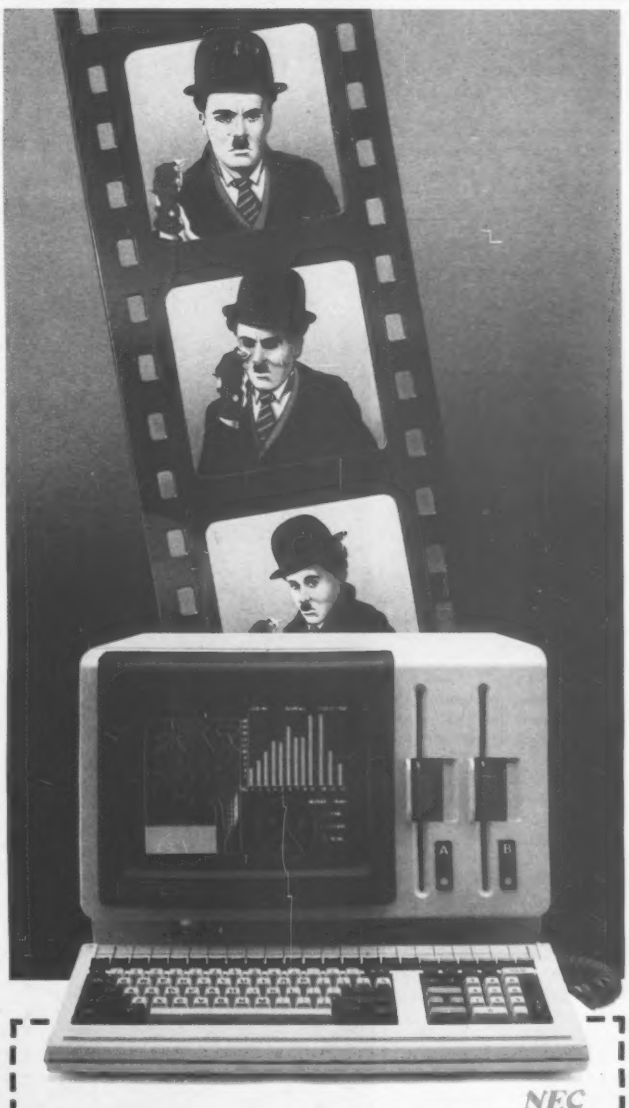

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Hospitals Tie CT Scanners Into High-Speed Net

HUTCHINSON, Kan. — Hospitals in Hutchinson, Halstead and Great Bend, Kan., are saving money and gaining computerized tomography (CT) scanning in a network linked by high-speed data transmission lines.

Until recently, the nearest hospitals offering CT diagnostics in this area were 90 miles away in Wichita. Ordinarily, CT services are too costly for individual community hospitals to support or justify. That has changed since the three hospitals hooked into the high-speed Southwestern Bell Dataphone Digital Service (DDS).

H. Gerald Smith, executive vice-president of the Hutchinson Hospital, explains why the Hutchinson medical community sought a CT scanner.

"There was often a wait of several weeks before Hutchinson patients could be scheduled for CT scans in Wichita," he said. "This delay left much to be desired on the part of patients and their doctors, who needed the CT scans to use in diagnosis.

"With a scanner of our own, we could keep patients closer to home and provide the best possible care with less inconvenience to them and their families. And we could do it at less cost than referring them to another city."

Obtaining scanners was a smart business move for the three hospitals, said Southwestern Bell Communications Specialist Monte Mitchel of Wichita. He coordinated communications planning for the novel arrangement.

"CT scans represent a source of new hospital revenue — a revenue stream which had flowed out of town," he said.

But CT scanner equipment, which is one of the most comprehensive diagnostic tools available, is very expensive. Priced at $500,000 to $1.4 million, it is beyond the financial reach of many small hospitals.

Cooperative Arrangement

The Kansas cooperative arrangement makes scanner outlays more cost-effective. Such purchases must be justified to the regional and state health agencies that approve major expenditures.

The Kansas system cost $1.4 million with each hospital paying a third of the cost. Each hospital has a scanning unit, or gantry, with detectors that send messages to a computer and a video screen for viewing images. However, they share a single computer in Hutchinson which processes the information collected by the gantries and turns it into video images.

Typical CT scanner installations require a computer processor for each gantry. By sharing the computer, the hospitals are saving approximately $500,000 each.

This "Satellex" arrangement was devised by Elscint, Inc., a scanner manufacturer specializing in the medical imaging field. Elscint installed the first such system for three Philadelphia hospitals last year. The Kansas installation is the only other one of its kind, although several other hospital consortia have ordered Satellex systems.

Mitchell, who worked with Elscint and the hospitals in setting up the Satellex system, explained why rapid, error-free transmission is essential to the operation.

"Speed of data transmission can determine how long it takes to complete a scan," he explained. "And both for patient comfort and maximum scheduling, hospitals want to complete scans as quickly as possible.

"Errors, while not necessarily patient affecting, are costly in terms of time because information must be retransmitted. The digital transmission of DDS is ideal for this application because it transmits at 56K bit/sec with a guaranteed accuracy of 99.5%."

A complete scan consists of between 16 to 25 slices, or images, which must be transmitted to the Hutchinson computer and back to the video screens. With DDS, information for each slice can be transmitted in approximately 19 seconds.

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For Class of '86

School District Requires DP Literacy to Graduate

By Robert Batt
CW West Coast Bureau

MISSION VIEGO, Calif. — An Orange County school district here has declared that computer literacy courses will be a graduation requirement of its high school students beginning in 1986.

The Saddleback Valley Unified School District is believed to be one of the first school districts in the nation to make computer courses a compulsory part of the curriculum. "Since we are in the job of educating youth we need to be able to provide them with the tools they will need to use in their everyday lives," said John Daywalt, assistant suprintendent of instruction services for the school district.

"Today we use the phone as a common instrument and before too long the computer will be just as commonplace in our homes and offices," he added.

Programming A Problem

The class, which will last one semester, will cover the basics of computing, including how to use a computer and programming skills.

"Programming is the real problem when making computer literacy a graduation requirement," admitted Daywalt. "When you are dealing with a heterogeneous group of children with differing abilities it is difficult to say that all of them will be able to program a computer. Nevertheless we think we can say that."

Daywalt said the school district already possessed qualified teachers to teach programming skills and so the problem was not a lack of staff but the difficulty of the requirements involved in computer programming.

The computer literacy course can be taken by students either in their junior or senior years. However, when students graduate from one of the four high schools in the district they will need to have fulfilled the computer course requirement.

According to Daywalt, 1986 was chosen as a suitable year by which to phase in the graduation requirement and between 1,200 and 1,500 students will be the first to graduate under the program.

Sample Questionnaire

The decision to make computer literacy courses compulsory was taken after the school district was directed by the Board of Education in the district to look at what future graduate requirements should entail. A sample questionnaire was undertaken in the local area asking people what skills were most needed in their community and included input from parents, teachers, students and industrialists.

"As a result of this information it was decided that computer literacy should be a requirement of the 1986 class and beyond," said Daywalt.

Like many school districts around the nation, the Saddleback Valley Unified School District has been offering computer courses on an elective basis for several years. Of the four high schools in the district, two are already fully equipped with the necessay computer systems and have computer laboratories and a third is well on its way to having a complete system, Daywalt said.

A committee comprised of teachers, administrators and possibly parents is being set up to determine the course curriculum for the high schools. Part of its job will be to examine hardware and software requirements, to talk with vendors and make purchase recommendations.

The school district has 6,000 students in total, and since the Board of Education has now made computer literacy a graduation requirement funding will come from its general reserves, which comprises 50% state funds and 50% local funds. Also, the school district is looking to involve local companies in funding the cost of the program.

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Call for Papers

NATIONAL ON-LINE MEETING '83, New York, N.Y., April 12-14.

Papers are being solicited for publication and presentation at the annual conference. Suggestions for topics are welcome. Subjects already being considered are personal computer networks for information exchange, full-text data bases, end users vs. intermediaries, current and future research, facsimile transmission, advances in teletext and videotex, electronic mail and teleconferencing, electronic publishing, marketing of information services and products, business information on-line, data base machines, the international information scene, economics of on-line in the library, educational training for on-line, the role of minis and micros, research on user behavior and numeric data bases.

If you would like to submit a paper, write to the program chairman by Aug. 23, giving brief details of your proposed paper, including title and abstract. Completed typescripts of papers are required by Dec. 1. A $500 award will be given for the best paper presented at the National On-line Meeting. Only papers received by the Dec. 1 deadline will be eligible for this award. Submissions and correspondence should be directed to Martha E. Williams, Program Chairman, National On-line Meeting, University of Illinois, Coordinated Science Laboratory, 1101 W. Springfield, Urbana, Ill. 61801.

INTERNATIONAL SYMPOSIUM ON COMPUTING SCIENCE (INTERKOMPUTO) '82, Budapest, Hungary, Dec. 27-Jan. 2.

Interkomputo is accepting papers for the symposium that will review both theoretical foundations and practical applications of computing science in order to aid international technical communications. Topics include basics of the analysis and synthesis of programs, the theory of data structures, program complexity, formal languages, cybernetics, artificial intelligence, robotics, user-friendly computing systems and other related topics.

Papers should be typed double-spaced and not exceed 12 pages. They should be sent with a one-page abstract before Sept. 10. Both the paper and the abstract must be written in the international language, "Esperanto." For translations of papers, contact the Esperanto organization in the U.S., which is the Esperanto League for North America, P.O. Box 1129, El Cerrito, Calif. 94530. The abstract and paper should be mailed to Interkomputo '82, NJSZT, H-1368 Budapest, pf: 240, Budapest, Hungary, Europe.

EDP AUDITORS FOUNDATION & AUTOMATION TRAINING CENTER THIRTEENTH CONFERENCE ON COMPUTER AUDIT, CONTROL AND SECURITY '83, Chicago, Ill., May 9-13.

The EDP Auditors Foundation and the Automation Training Center are seeking papers for presentation at the conference. Suggested topics include, but are not limited to, networks and distributed processing; data communications; auditing data base systems; reviews of operating systems; access control software; controlling on-line systems; auditing software acquisition; how to plan, conduct and document DP audits; how to determine control requirements and auditability in advanced systems.

A one-page abstract of the suggested presentation and a brief resume, including business telephone, should be submitted no later than Oct. 15 to Harold Weiss, Program Chairman, Automation Training Center, Inc., Suite 17, 11250 Roger Bacon Drive, Reston, Va. 22090.

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Seminar to Focus On Productivity

ARLINGTON, Texas — "Computer-Aided Productivity Improvement Systems" is the name of a newly developed 2½-day workshop that C.H. Link & Associates will conduct here Sept. 14-16; in Houston, Oct. 12-14; and in Norfolk Beach, Va., Nov. 16-18.

This workshop is intended to help directors or managers of automated systems maximize productivity in operations, analyze other automation opportunities, justify their investment and select the best system to do the job. Topics to be covered include group technology, computer-aided process planning, computerized manufacturing management systems, numerical control, material handling robots and automated warehousing.

Registration for this seminar/workshop is $375. Further details can be obtained from C.H. Link & Associates, P.O. Box 13635, Arlington, Texas 76013.

IEEE Dictionary Needs Updates

SAN DIEGO — The IEEE Computer Standards Committee is looking for people to form a working group that will update and enhance the volume *IEEE Draft Standard Computer Dictionary*.

Volunteers are needed to submit existing definitions, glossaries and dictionaries for incorporation within the dictionary and to evaluate current and proposed definitions for correctness, completeness and consistency.

Desired qualifications of working group members are experience in defining technical terms, expertise in one or more computer-related areas, the ability to commit 10 or more hours per month to the computer dictionary effort and the ability to attend three-day working group meetings quarterly for up to two years.

More information on the group is available from Jane Radatz, working group chairman, at Logicon, Inc., P.O. Box 80158, San Diego, Calif. 92138.

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Ex-NTIA Official Pessimistic

U.S. Seen Unlikely to Form Info Policy Soon

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — The U.S. government is unlikely to develop an adequate policy-making mechanism for international communications and information soon, a former Commerce Department official said recently.

Addressing the general assembly of the World Future Society here, Veronica Ahern admitted to "pessimism and cynicism" about efforts to reorganize government response to international information issues. But she said continued pressure from Congress and the private sector for such reorganization will serve to keep these issues at a high level of federal attention.

Ahern, now a member of a Washington, D.C., law firm, was until recently director of the National Telecommunications and Information Administration (NTIA) Office of International Affairs. She was one of many speakers at the World Future Society's meeting who expressed dismay over the government's inability or unwillingness to coordinate better information policy activities.

Four Reasons

Ahern gave four reasons for believing successful government reorganization in this area may continue to prove elusive:

• "It has been tried before," she said, noting reorganization proposals date back 20 years. "All of the plans failed," she said, adding however, that they did serve to concentrate high-level federal attention on the problems of international communications and information faced by the U.S.

• "Bureaucracies have a tendency to protect their turf," she noted, suggesting that human nature stands in the way of successful reorganization. Agencies that now have some authority over these international matters will not want to give it up.

But neither will those agencies be able to marshal sufficient resources to handle these issues adequately, Ahern said, pointing to the present governmentwide "resource problem . . . Most of the government agencies that are dealing with [these issues] are grossly understaffed."

• The U.S. is "almost unique in the world" in that it relies on private-sector competition to define its telecommunications structure, she continued, pointing to a "side effect" of competition on the government. In trying to develop policies beneficial to the private sector, agencies find that "what may be good for one company may not be good for another."

It is "the nature of coordination," she observed, that policy makers' constituents conflict on desired action or inaction. As a result, "we seldom . . . can agree on specific policy goals," which often leads agencies to adopt only the "least offensive policy position" generally satisfying no one, Ahern said.

• No matter what actions the executive branch of the government takes to coordinate international communications and information policy, Ahern noted that "most, if not all, the power in the field lies with the FCC [Federal Communications Commission]." Even if the executive agencies and Congress agree on certain policies or goals, there is no way they can be certain that the FCC, an independent agency, will act accordingly, according to Ahern.

Despite this pessimistic outlook, Ahern asserted "I would not want the [reorganization] effort to stop." She explained that "if there is no attention paid to this . . . then we're going to slip back, and we're going to slip back to an era when there is no coordination and all the agencies go their own way."

If that happens, U.S. policy decisions in this area will not get the high-level attention they require, she said. Congress has focused a lot of attention on this subject, she added, saying only "constant pressure to improve our [policy] coordination mechanisms" will improve the present situation.

Steps Suggested for Forming U.S. Information Policy

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — Amid the generally gloomy predictions for federal information policy activities presented at the recent World Future Society meeting here, one long-time Washington observer laid out a near-term government plan of action to welcome the information age coherently in the U.S.

"We are only on the frontier of this vital policy-making area; only a handful of our national policy makers even have the slightest understanding of what is involved in the term 'information policy,'" Robert S. Willard, Information Industry Association vice-president for government relations, told the conference last month.

Noting "the fragmentation of responsibility for information policy and a lack of sensitivity to that fragmentation," Willard decried what he sees as "the current trend" in government "to ignore or downplay legitimately established information policy roles."

Despite this trend, he asserted, "the discussion of the need for a focus on information policy is quite mature; it now remains for this discussion to be converted to action." Willard suggested several "specific steps . . . to help advance the state of information policy and, correspondingly, the future of the information policy":

• "Beef up the existing institutional mechanisms for dealing with information policy," paticularly within the Office of Management and Budget and the National Telecommunications and Information Administration. "Put more money into . . . activities which are focusing on emerging industries, instead of just using federal money to bail out failing industries."

• "Establish a new institutional mechanism for dealing with information issues." Willard noted that Canada, the UK, France and Japan and other industrialized nations already have such mechanisms. "I am not by any means advocating a central planning apparatus for the future of this nation's information and communications infrastructure," he said, adding, however, that "a centralized agency, a government-sanctioned think tank, perhaps, would contribute greatly to the understanding and development of the information industry."

He noted that Rep. George Brown Jr. (D-Calif.) has proposed legislation to create a national institute for information policy and urged Congress to pass the bill, H.R. 3137.

• "Our churches and our schools should think more about the ethics of the Information Age," Willard said.

• "The information needs of the disadvantaged must receive attention both at home and abroad. As information increasingly becomes a marketplace commodity, public mechanisms such as libraries or other institutions must evolve policies and procedures to assure access of all people to information."

• "We should develop a system with the greatest unrestricted flow of information possible, both domestically and abroad." Willard also said that "we should not establish any barriers to international trade in information services, nor should we tolerate any."

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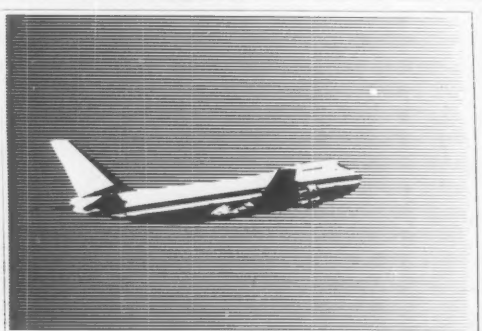
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Auto Distributor Finds Net, Ecom Bring Parts, Car Sales

By Bob Johnson
CW New York Bureau

NEW YORK — An automobile distributor here is using the U.S. Postal Service's Electronic Computer-Originated Mail (Ecom) service to provide what it claims is the only customer service communications system of its kind.

World-Wide Volkswagen Corp. of Orangeburg, N.Y., links 149 Volkswagen and Porsche & Audi car dealers thoughout the New York, New Jersey, and Connecticut Tri-State area to an on-line service history data base residing in a central IBM 4341 CPU.

The company said that its "one-of-a-kind" telecommunications system allows car owners to receive better and faster service through the system, which has terminals set up on the service desks of their dealers.

In addition, the company said, now that the system is hooked up to Ecom, even sales applications are being used, allowing dealers to do mailings to customers, which is proving to be "very successful."

Push for Service

Owen Monaghan, the director of systems and DP for World-Wide, explained that a study conducted by his company in 1978 showed that dealerships were selling less service, and as a result, fewer parts. World-Wide decided that it needed a system other than the card system it was then using to show if customers were or were not coming in for scheduled maintenance. The company wanted to be able to have a list that it could use to send a mailing in hopes of bringing service customers into the shop, according to Monaghan.

"Our system is one of the most advanced in the automotive business," Monaghan claimed. "Our dealers have IBM Model 3276 and 3278 CRTs and a printer which allows them to call up a customer's service record by using the vehicle identification number or car chassis number. The service manager can check if the vehicle is overdue for a tune-up that could be a potential problem."

The company also said that motorists who are having their cars serviced at one of the participating dealers in a state other than the one where the car was originally purchased can have their records traced back to the source dealer to check for warranty dates in the event of a major problem.

"Because the dealer can quickly determine whether the car's engine is still under warranty, even though the original work was performed in another state, the repairs can be handled promptly. The customer is satisfied, and the product's reputation is retained," World-Wide stated.

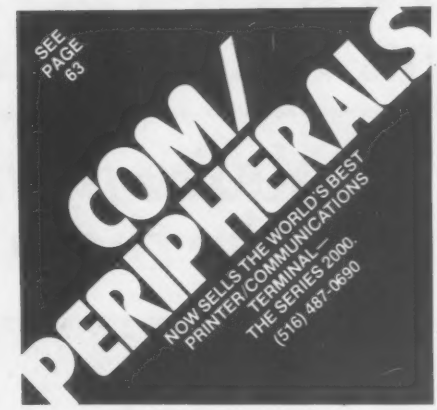
Parts Sales

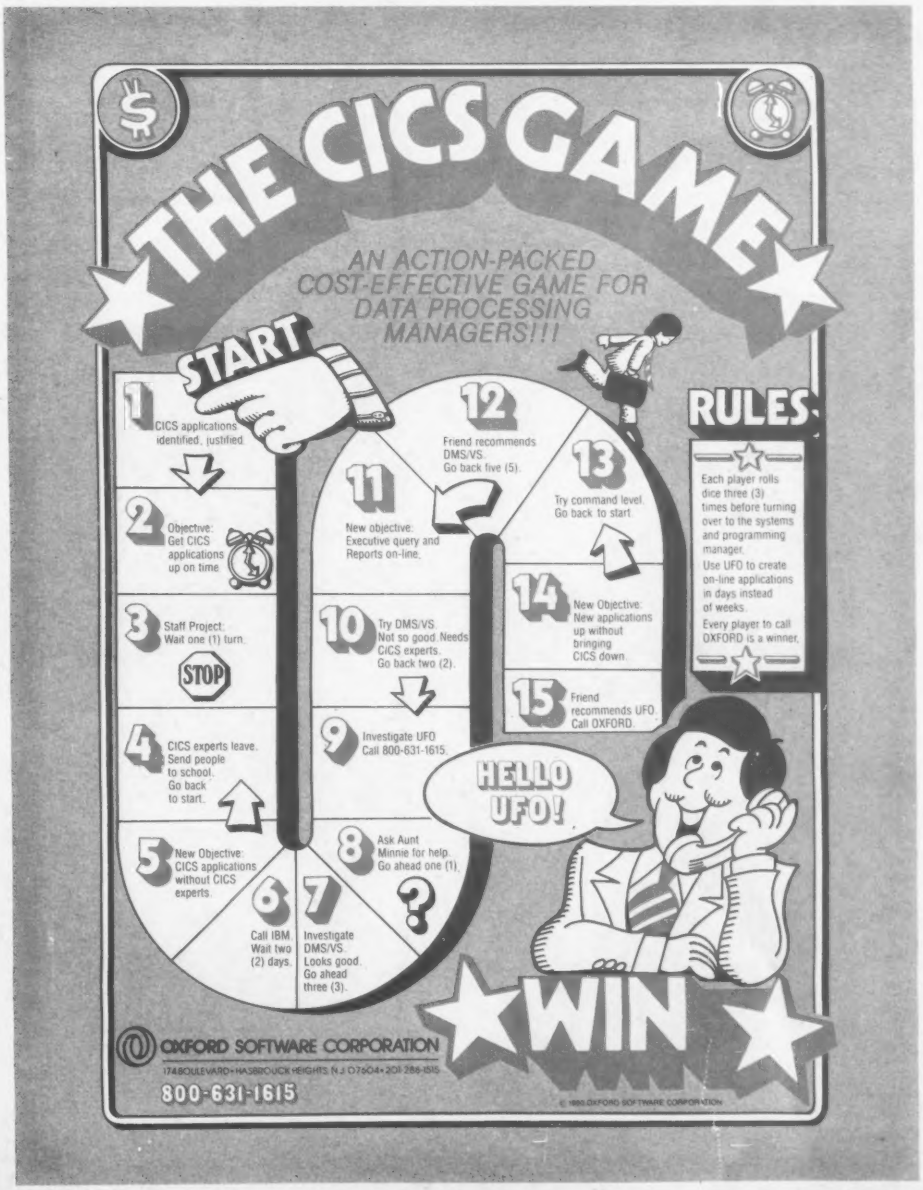
Volkswagen dealers rely on the sale of parts for a significant portion of their profits, according to World-Wide.

The company said that one of its dealers reported 1981 sales in service parts were 12% to 14% higher than the same six-month period in 1980, despite the dismal economic conditions in the auto industry. The company attributed this success to its communications system.

Monaghan applauded the recent addition of Ecom to his system and maintained that World-Wide is one of Ecom's biggest users. "We are using Ecom letters for the sale of cars now and it's working out fine," he said.

The company added that dealers use the customer list to target promotional mailings. World-Wide said that one dealer recently issued a mailing to its service customers announcing a Sunday open house for a new anniversary model and sold 38 cars that day.





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Of course it's important to save money in your EDP department. But it's even more important to make the best possible use of your programmers so they can spend more of their valuable time developing special applications that save money across your entire company. And we have a long list of software tools which help them do just that.

To begin with, your programmers won't have to spend a minute designing applications for word processing, electronic mail, management reporting, or business graphics. We've got off-the-shelf software for all these functions.

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Switches to Development Systems

Mining Firm Strikes Inquiry Screen Paydirt

WHITE PINE, Mich. — After working several months last year to develop applications on-line, the White Pine Copper Division of the Copper Range Co. had only two on-line inquiry screens to show for its efforts. Then the mining company switched to an application development system to aid its 11-person data processing staff in completing more than 80 screens in nine months.

White Pine mines 12,000 tons of ore each day to produce about 3.5% of the nation's primary copper supply, a company spokesman said.

The mine keeps track of 700 pieces of machinery above and below ground, the location of 1,300 employees working three daily shifts and a warehouse inventory of 30,000 items. "Our reports were always arriving late," director of data processing George Monville said. "Now most of the records processing has been accelerated, simplified and organized."

Since the implementation of the Oxford Software Corp. User Files On-Line (UFO) system, the DP staff has created an average of one screen per day. "I feel it is a superior product because there are no [IBM teleprocessing module] CICS table updates necessary to generate screens. UFO helps us rapidly develop and maintain our on-line applications without requiring that our programmers have extensive knowledge of CICS programming," Monville said.

Maintenance Scheduling

By using the application development system to schedule maintenance on the seven miles of conveyor belt that runs through the mine and the underground machinery, the mechanics can eliminate trial-and-error diagnostics. When they receive equipment for scheduled maintenance, they can now confirm a machine's breakdown/repair history, Monville said. The mechanic calls up a machine's record and learns when it was last serviced, for what problem, how it was repaired and the number of hours between engine overhauls.

Generating reports is a daily practice for many Copper Range Co. employees. At 6:30 every morning, one clerk on the mine surface inputs data that will compose a report describing the performance of the previous three shifts. This updated report is viewed by key managers before each shift to analyze the progress made, the location of machinery and the tasks assigned to each miner, Monville said.

A clerk, whose office and terminal are both located underground, keeps necessary parts stocked in an underground warehouse. By calling up inventory records of the surface warehouse, the employee can see if the parts needed are available. Before the system was installed, the clerk had to fill out an order slip and take it above ground before he discovered that a part was not in inventory, Monville explained. Underground supplies are needed at least once a day, so the clerk saves approximately one hour by eliminating unnecessary trips to the surface warehouse.

White Pine purchasing agents also can be found in front of the CRT. They spend about five hours each day performing their purchasing functions. By typing in a warehouse code number, an agent has access to information on any product kept in the warehouse. This report includes the vendor master number, the required time for ordering, pricing information and outstanding purchase orders issued for that item. Agents had previously spent considerable time leafing through a 700-page catalog, a company spokeman said.

Training Not Difficult

Currently, one CICS programmer at the White Pine Copper Division does most of the research and screen development although the entire team of programmers know and use UFO.

Monville added that training end users was not difficult. "A person is able to learn how to access the information that pertains to his job in just half a day. We found that training the users on-site, one on one, is best, so one DP employee is devoted to all the training. We also make available the HELP command in case our users need additional assistance while they are working on-line."

The company's DP department works two shifts daily and uses an IBM 4331 processor running DOS/VSE under VM with 2M bytes of memory. The system manages 34 distributed terminals, nine of which are in the mine department, a company spokesman said.

Course Treats IDMS, IDD

NEWTON, Mass. — Two video education courses for users of Cullinane Database Systems Corp.'s data base management system — IDMS — and data dictionary — IDD — software products have been announced here by Eastern Technical Associates, Inc. (ETA). The software reportedly runs on IBM mainframes and plug-compatibles.

The IDMS course consists of 20 student guides and 45-minute cassettes. The IDD course includes 12 video cassettes averaging 40 minutes each plus 12 student guides. Both courses cover all aspects of their latest respective software releases and reportedly serve both first-time and experienced users.

The IDMS course can be purchased for $8,500, while the IDD sells for $4,800; both are available on annual rental plans. ETA is located at 189 Wells Ave., Newton, Mass. 02159.

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Insurance Firm Gets Coverage With Utility

RED WING, Minn. — Citizen's Security Mutual Insurance Co. here was just looking for a better communications utility program for its on-line and batch operations. It got that and more with a utility package that not only improved its own insurance-related applications but also allowed it to take over the on-line processing for a local bank as well.

The utility software package now running on the insurance firm's Burroughs Corp. B1855 mainframe consists of 16 integrated programs grouped into three packages. Technalysis Corp. of Minneapolis developed the Technalysis Communication Utility Packages (Tcup), which include message control, screen formatting and job execution functions.

"Our reasons for choosing Tcup were to provide better control over on-line and batch operations, better system security, greater operator flexibility and more productive use of equipment and personnel," according to Michael L. Halvorson, a Citizen's vice-president.

Bank Processing

The ability of software purchased from Technalysis Corp. to run several programs at once from the same terminal has increased system efficiency and throughput at Citizen's Security Mutual. "But it's the main reason we were able to take on the bank's processing load," Halvorson said. "At first, the bank people didn't believe it was possible."

A banking software package from Information Technology, Inc. of Lincoln, Neb., also runs on the system for the Goodhue County National Bank just around the corner. "We update the saving accounts and loan accounts and do the general ledger," Halvorson said. "We bring them up at 8 a.m. until 6 p.m. and run their updates until 9 p.m."

Citizen's Security Mutual had been using another message control system that required changing the software each time a new on-line program was added. "We also need the capability to add new programs without recompiling the message control system," Halvorson said.

Programmer Productivity

The utility package has also increased programmer productivity. "More information is made available to the operator and on-line editing saves substantial time," according to Halvorson. "Provided they have the correct password, users can enter and control jobs from any terminal; they don't have to bother the programmers or computer operators. Depending on the type of program, we've cut coding time by a minimum of 20% to as much as 80%."

At first the company had experimented with the screen formatting package before discarding its own "homegrown" formatter. "Our goal was to give the programmer unlimited flexibility in designing a screen format from scratch," according to a Technalysis spokesman. "A system can be created in Cobol or in Burrough's Gemcos code."

The package has five built-in security levels that provide the company with the option of who has access to the files. "The bank's auditors and our own auditing firm were pleased to see the extensive security measures," Halvorson said.

Using 12 characters, the job execution system can initiate a series of jobs with one command and let them run unattended. Batch programs can be run from a terminal with all information returned to that terminal. "A batch job stream can be started at a specific time and restarted at the proper point in case of a stop due to a program error — without rerunning the entire stream," Halvorson said.

When the company wants to expand the hardware, it will just add terminals, Halvorson said. "And the ease with which we've added on-line programs proves that our decision to install Tcup was the right one," he said.

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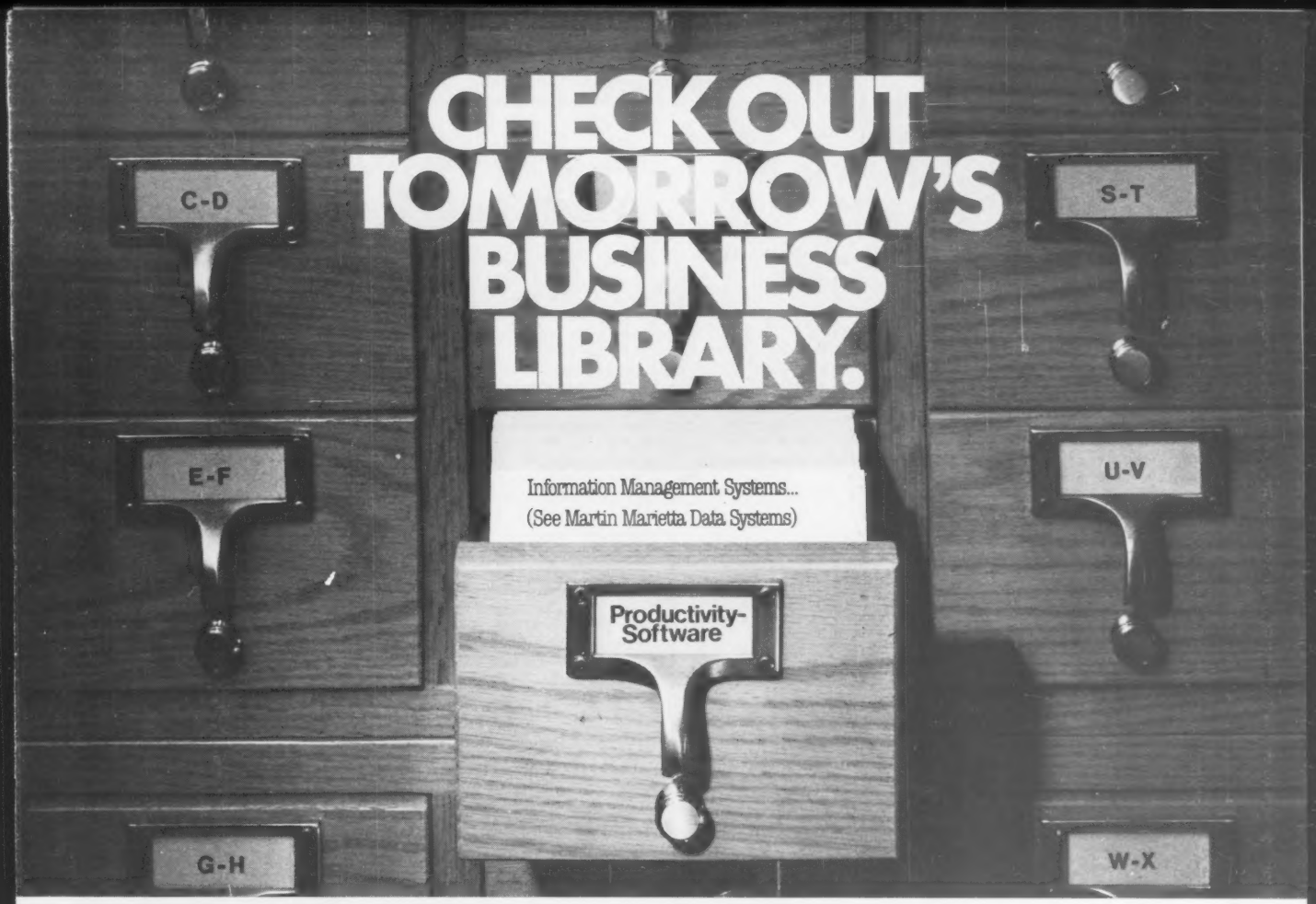

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Janitor in a Minicomputer Maintains Campus Scene

STANFORD, Calif. — A computer that cuts grass? Not quite, but Stanford University's physical plant recently assigned a minicomputer to keep track of maintenance duties on the school's 1,700-acre campus here.

"Our computer allows us to handle more than 200 telephone inquiries and scores of scheduled projects each day. These requests include everything from repairing broken dormitory windows to maintaining critical environmental controls in several research centers. In essence, our work information center provides many of the nonacademic services for a student and staff community of 20,000. One could consider Stanford to be the equivalent of a $16 million business," according to James J. Horgan, director of operations and maintenance.

Before the university installed the Hewlett-Packard HP 3000 system in the fall of 1980, the maintenance department was managed by a manual record-keeping system, which was occasionally augmented by batch processing on the university's mainframe processor. The university was faced with a recurring problem of misplaced or unrecorded work orders, he recalled, and the result was that some jobs went uncompleted. In addition, it was difficult to find out what work was getting done and how much it cost to complete, Horgan said.

The system consists of an HP 3000 Series 30 processor with 512K bytes of main memory. Linked to the processor are seven HP 2645A CRT terminals and two 7906 disk drives, Horgan said.

As requests enter the system by telephone or campus mail, data entry personnel key the requests into one of seven CRT terminals. Each terminal has a forms capability which allows the dispatcher to transfer the information from a hard-copy request to a work order on the CRT screen, Horgan said.

For a telephone request, the dispatcher enters the information directly on the CRT screen. Once orders are keyed into the system, a dedicated printer automatically generates a hard-copy work order for distribution to the shops involved with a project. A copy is also sent to the university's central accounting office, according to Horgan.

Instantaneous Response

Once work information is keyed into the system, the maintenance supervisers have immediate access to it via the CRT terminals. The system's interactive capabilities permit the supervisory personnel, who oversee 24 separate work departments, to ask maintenance status questions and receive instantaneous responses. For instance, a supervisor can access the estimated hours in the maintenance department, the backlogged hours in the machine shop and the jobs completed by high-voltage electricians, Horgan said.

On-line inquiry is aided by two HP software packages, which compliment programs developed by Stanford personnel. HP's Image/3000 data base and the Query/3000, a data base query language are used to access maintenance files with English-like commands, Horgan said.

At the most basic level, supervisors can access the data base to find out if a particular job has been completed. At a somewhat higher level, departments have the capability to determine what areas are constantly backlogged or which facilities are in need of regular service.

As supervisors find work areas overloaded, or as work requiring special skills or equipment arises, Stanford's maintenance department is forced to seek help from outside contracting firms. Before installing the system, the need for contract work, as well as its status, was impossible to document accurately, Horgan said.

As work orders enter the system for day-to-day facilities upkeep, they also become part of a maintenance data base being constructed in conjunction with the university's mainframe processor, an IBM 3033. Three months' worth of information is stored in the HP 3000's disk memory. It is then transferred to the IBM processor for statistical analysis, Horgan said.

The data base analysis is expected to improve budget documentation. Horgan said the information will also be used to create a comprehensive preventative maintenance program, which will reveal each department's regular customers and particular problem areas.

"To maintain the campus properly, we could not limit our managers to tape measures and clip boards as tools. Introducing our personnel to interactive computing is our attempt to reconcile our current maintenance needs with those that will arise through the university's expansion and advances in research technology," Horgan said.

ISO Handbook Trio Out From Ansi

NEW YORK — The American National Standards Institute (Ansi) is offering three handbooks developed by the International Standards Organization (ISO).

"Hardware — Handbook 8-1982" contains all ISO standards for the physical equipment used in DP — paper tapes and cards, magnetic tapes and disk packs, cartridges, reels and connectors. The 430-page book costs $40.

"Software — Handbook 9-1982" is a compilation of current ISO standards dealing with DP procedures, rules and programs, ranging from specifications for character sets for information exchange to flowchart symbols. The 450-page book costs $40.

"Vocabulary — Handbook 10-1982" provides precise definitions of thousands of terms commonly used throughout the DP world. It includes a consolidated alphabetical index. The 360-page book costs $30.

The three books may be purchased together for $100, Ansi said from 1430 Broadway, New York, N.Y. 10018.

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Sept. 7, Boston. — **California Computer Show.** Contact: Norm De Nardi Enterprises, Suite 204, 289 S. San Antonio Road, Los Altos, Calif. 94022.

Sept. 7-10, London — **The 6th International Conference on Computer Communication.** Contact: International Conference Communication, P.O. Box 23, Northwood Hills, Middlesex HA6 1TT, UK.

Sept. 7-10, Milwaukee — **Project Management.** Contact: Bill Schoomaker, BSI, 4720 Montgomery Lane, Bethesda, Md. 20814.

Sept. 7-10, New York — **CICS Application Design Course.** Contact: Sys-Ed, One Park Ave., New York, N.Y. 10016.

Sept. 8-10, Washington, D.C. — **Human Factor Issues in Computer Graphics.** Contact: The George Washington University, Washington, D.C. 20052.

Sept. 8-10, Boston — **DP Quality Assurance.** Contact: Q.E.D. Information Sciences, Inc., Q.E.D. Plaza, P.O. Box 181, Wellesley, Mass. 02181.

Sept. 8-10, New York — **MVS SP 1.3 Differences.** Contact: Amdahl Corp., 1211 Ave. of the Americas, New York, N.Y. 10036.

Sept. 9-10, Boston — **Effective Presentations.** Contact: Q.E.D. Information Sciences, Inc., Q.E.D. Plaza, P.O. Box 181, Wellesley, Mass. 02181.

Sept. 9-10, Philadelphia — **DP Concepts for the Non-DP Manager.** Contact: Q.E.D. Information Sciences, Inc., Q.E.D. Plaza, P.O. Box 181, Wellesley, Mass. 02181.

Sept. 9-10, New York — **Magnetic Media, "Tape/Disk Talk" Workshop.** Contact: Stored Information Systems, 102 Cresci Blvd., Hazlet, N.J. 07730.

Sept. 9-10, Washington, D.C. — **Selecting a Local Network.** Contact: Architecture Technology Corp., P.O. Box 24344, Minneapolis, Minn. 55424.

Sept. 9-11, Orlando, Fla. — **How to Plan, Implement and Manage a Word Processing System.** Contact: Battelle, 4000 N.E. 41st St., P.O. Box C-5395, Seattle, Wash. 98105.

Sept. 13-14, Boston — **Documentation for People.** Contact: Carnegie Press, 100 Kings Road, Madison, N.J. 07940.

Sept. 13-14, Denver — **Fundamentals of Data Processing for Accounting and Financial Managers.** Contact: University Seminars, Suite 2846, 420 Lexington Ave., New York, N.Y. 10017.

Sept. 13-14, Boulder, Colo. - **Device Independent Graphics Seminar.** Contact: Precision Visuals, Inc., 250 Arapahoe, Boulder, Colo. 80302.

Sept. 13-15, Boston — **OA Forum.** Contact: CW Conference Management Group, 375 Cochituate Road, Box 880, Framingham, Mass. 01701.

Sept 13-15, Boston — **Structured Testing.** Contact: University Seminars, Suite 2846, 420 Lexington Ave., New York, N.Y. 10017.

Sept. 13-15, Boston — **Data Analysis.** Contact: Q.E.D. Information Sciences, Inc., Q.E.D. Plaza, P.O. Box 181, Wellesley, Mass. 02181.

Sept. 13-15, Geneva, Switzerland — **Autofact.** Contact: Society of Manufacturing Engineers, Gregg Balko, Senior Casa/SME Administrator, One SME Drive, P.O. Box 930, Dearborn, Mich. 48128.

Sept. 13-15, San Jose — **Fundamentals of Data Communications.** Contact: University Seminar, Suite 2846,

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Sept. 13-17, New York — **CICS Command Level Programming.** Contact: Sys-Ed, One Park Ave., New York, N.Y. 10016.

Sept. 13-17, Boston — **Systems Analysis and Design Workshop.** Contact: Registrar, Institute for Advanced Technology, 6003 Executive Blvd., Rockville, Md. 20852.

Sept. 13-17, Boston — **Systems Analysis Workshop.** Contact: Q.E.D. Information Sciences, Inc., Q.E.D. Plaza, P.O. Box 181, Wellesley, Mass. 02181.

Sept. 13-17, Reno, Nev. — **Computer Performance Measurement and Capacity Planning.** Contact: Registrar, Institute for Advanced Technology, 6003 Executive Blvd., Rockville, Md. 20852.

Sept. 14-15, Dallas — **Fundamentals of Data Processing for Accounting and Financial Managers.** Contact: University Seminars, Suite 2846, 420 Lexington Ave., New York, N.Y. 10017.

Sept. 14-16, Philadelphia — **Design of On-Line Systems.** Contact: Q.E.D. Information Sciences, Inc., Q.E.D. Plaza, P.O. Box 181, Wellesley, Mass. 02181.

Sept. 14-17, Boston — **Data Communications: Components, Systems and Network Design.** Contact: Registrar, Institute for Advanced Technology, 6003 Executive Blvd., Rockville, Md. 20852.

Sept. 15-17, Cincinnati — **Fundamentals of Data Processing for Non-Data-Processing Executives.** Contact: University Seminars, Suite 2846, 420 Lexington Ave., New York, N.Y. 10017.

Sept. 15-17, New York — **Data Communications Network Design.** Contact: Registrar, Institute for Advanced Technology, 6003 Executive Blvd., Rockville, Md. 20852.

Sept. 15-17, Buffalo, N.Y. — **Solutions' Teaches Efficiency and Tuning of Vsam.** Contact: Mary McGuire, Solutions, Inc., Box 989, Montpelier, Vt. 50602.

Sept. 15-17, New York — **Software Quality Assurance.** Contact: Registrar, Institute for Advanced Technology, 6003 Executive Blvd., Rockville, Md. 20852.

Sept. 15-17, Phoenix — **Micro and Home Computers: Technology and Applications.** Contact: Registrar, Institute for Advanced Technology, 6003 Executive Blvd., Rockville, Md. 20852.

Sept. 15-17, Los Angeles — **Fiber Optics.** Contact: Information Gatekeepers, Inc., Suite 111, 167 Corey Road, Brookline, Mass. 02146.

Sept. 16-17, Cranford, N.J. — **Magnetic Media, "Tape/Disk Talk" Workshop.** Contact: Stored Information Systems, 102 Cresci Blvd., Hazlet, N.J. 07730.

Sept. 16-17, Boston — **Data Base Design.** Contact: Q.E.D. Information Sciences, Inc., Q.E.D. Plaza, P.O. Box 181, Wellesley, Mass. 02181.

Sept. 16-17, New York — **Documentation for People.** Contact: Carnegie Press, 100 Kings Road, Madison, N.J. 07940.

Sept. 16-17, San Diego — **Personal Computers for Managers.** Contact: Integrated Computer Systems, 3304 Pico Blvd., Box 5339, Santa Monica, Calif. 90405.

Sept. 16-19, Minneapolis — **The Twin Cities Computer Show and Applefest.** Contact: The National Computer Shows and Office Equipment Expositions, 824 Boylston St., Chestnut Hill, Mass. 02167.

Sept. 19-21, Cambridge, Mass. — **Association of Information and Dissemination Centers 1982 Fall Meeting.** P.O. Box 8105, Athens, Ga. 30603.

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Circles, vectors, arcs, rectangles and polygon fills are generated with hardware rather than software. As a result, image response is almost instantaneous.

Beacon's 16x zoom feature can be controlled from the keyboard in 1x increments. Both horizontal and vertical scrolling is variable in speed and exceptionally smooth. Beacon also provides reverse video and underline, as well as blinking and variable height characters.

Other graphics features include: 640 x 480 resolution (standard); 6 memory planes with 256 colors—up to 32 usable at a time (16 in the graphics plane and 16 in the alpha numeric plane)—and 18 programmable function keys on the keyboard and another 18 on the display bezel.

Human-factors engineering.

The human factors, or ergonomics, that make a computer personally comfortable played an integral part in the Beacon System's design.

The critical area of reducing eye strain and fatigue has been accommodated through the development of a screen image *twice as steady* as the image in other computer systems, including those that are advertised as "flicker free." For extra visual comfort, the brightness of the Beacon image is controllable at the keyboard, and an anti-glare filter reduces distracting reflections.

And Beacon's commitment to superior ergonomic design doesn't stop there. To avoid back strain, the monitor tilts, swivels, and uniquely adjusts 5.5" in height. In addition, the keyboard is separate from the display and can, therefore, eliminate the sense of being tied down to the monitor.

Other hands-on features that make for greater comfort and productivity are: a three-degree adjustable tilt in the keyboard, a palm rest, tactile feedback, sculptured keys, and a dimpled home key in the function and numerical key clusters.

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EDITORIAL

'Don't Quote Me'

Does a DP manager have cause for concern if his company hires a Big Eight accounting firm for DP consulting as well as audit services?

"No" was the almost uniform response that *Computerworld* received from independent accounting firms when it surveyed them recently.

In the same issue in which the results of that survey were published [CW, April 19], *Computerworld* asked DP managers to tell us about their experiences dealing with independent accounting firms that provide both auditing and non-audit services.

To date, DP managers have been strangely silent on this subject. They have been been unwilling to share the problems they face — publicly, that is.

Privately, on the other hand, a number of DP professionals have shared their stories with us:

• A DP manager said that a one-week audit of his department by a Big Eight firm, made at the request of a corporate president, turned out to be a "hatchet job and/or witch hunt." The auditors recommended that the entire DP staff be discharged and that all in-house software be replaced with packages. "Additionally, they offered to assist in the recruitment, system design and product procurement," he wrote.

When this manager was contacted for the further details he promised to supply, CW's reporter was informed that the manager had since "left the firm."

• A systems programmer said that the first time he disagreed with the DP-related recommendations made by a Big Eight firm, he was handed a severance check and told "they didn't think it had worked out."

In his next job, his managers suggested bringing in the same Big Eight firm to study a service organization they wanted to set up. Having been burned once, this systems analyst tried, to no avail, to warn his immediate boss and *his* boss of the potential problems.

Six months later, at the insistence of the audit firm, the DP manager was fired by the vice-president of DP. The vice-president, in turn, was subsequently fired.

This systems analyst fled DP after these experiences, but offered the following advice to DP professionals in their dealings with independent audit firms: "Be prepared to cooperate completely or else get your resume out."

• After describing a number of run-ins with audit firms, another DP professional said his current policy is "They come, I go. No wait, no fuss."

Although CW received one letter describing an amicable situation between an audit firm and the DP department, most DP managers had horror stories to tell. Their letters warned, in effect, "Don't quote me or I might have problems."

Maybe when the Big Eight firms claim there is "no conflict," what they mean is that DP managers generally don't rock the boat because if they do, they end up reading the want ads for another job. If there is truly "no conflict," then why all the secrecy?

It seems likely that for every DP manager who wrote in and insisted on being "off the record," there are several more who are hesitant even to put pen to paper.

Perhaps if the silence were broken, some of the problems caused by mixing auditing and DP consulting could be aired — and alleviated.

'Eureka!'

LETTERS

No 'Inside Information'

"Good News for Users: IBM Didn't Raise Its Prices" [CW, July 26] did not accurately quote my views on this subject.

In particular, the article stated that I said "IBM *plans* to cut prices by as much as 20% on some items this fall. Fertig mentioned the 3081D processor as one IBM product that is overpriced and is *slated* for a price reduction."

What I really stated was that based on my analysis of the IBM product line, the IBM 3081D was not on the same price/performance curve of the other 30 series models (E, B, J and K), therefore, I believe a reduction for the 3081D of approximately 20% is required to correct this condition.

I never pretended to have any inside information on IBM's "slated" pricing plans as the article suggests.

R.T. Fertig
President
Enterprise Information Systems, Inc.
Greenwich, Conn.

Encouraging PCM

As the organizers of the first annual Compatible Computer Conference (CCC), we'd like to register a different view than that expressed in "First Nationwide PCM Meet a Disappointment" [CW, May 24].

Attendance was lower than what we had hoped, but given that we're not a Comdex, a National Computer Conference or a Computerweek, the attendance was encouraging.

When one considers the fact that other users' groups such as Guide and Share began with attendance of 65 and 46 people respectively, we who are associated with Plug feel that the first CCC was very successful. In today's economic climate, we feel the fact that more than 120 users and vendors chose to attend CCC is indicative of the need for this type of representation.

We do not have the sponsorship of an association or group of associations, a respected trade publication or a hefty set of exhibit fees from manufacturers in the field. We have gone out of our way to avoid those ties, to keep the conference and the resultant cross-product users group as free from potentially compromising affiliations as possible.

Funds for promotion, publicity and organization came out of the pockets of individuals who feel that this segment of the national computer industry deserves a free and independent convention and users group.

The plug-compatible manufacturers (PCM) concept and market are not well understood. *Computerworld* and the *San Francisco Examiner* were notable in their understanding of them. But even the *San Jose Mercury*, in the heart of Silicon Valley where so many PCM companies are based, decided that the conference and Plug were too complex to handle.

As was evidenced during the conference, there is not only a great deal of interest in this concept, but also a genuine desire to participate in our efforts to make clear the implications and potential benefits to be derived by encouraging the PCM industry.

Ed Dugan
President
Plug
San Mateo, Calif.

Computerworld welcomes comments from its readers. Preference will be given to typed, double-spaced letters of 150 words or less. Letters may be edited for purposes of brevity and clarity. Letters should be addressed to Editor, *Computerworld*, 375 Cochituate Road, P.O. Box 880, Framingham, Mass. 01701.

READER COMMENTARY/Robert V. Jacobson‡

Three Kinds of Consultants: Which Is Best?

In a recent *Computerworld* article, "Smart Shoppers May Find Consultants a Bargain" [CW, July 26], Robin F. Goldsmith described two kinds of consultants: contract employees and traditional consultants who provide professional advice. There is a third kind: the salesman who masquerades as a consultant.

Depending on circumstances, the client may actually want to engage the salesman/consultant who can furnish both problem definition *and* problem resolution. The resolution may take the form of additional consulting services or it may involve hardware that the salesman/consultant furnishes and installs for the buyer.

The wise client will recognize that the salesman/consultant does *not* provide the "informed objectivity" that Goldsmith identifies as the greatest value of the traditional consultant.

Obviously, the salesman/consultant has a conflict of interest between objective advice for his client and good business for his firm. (In more sinister cases the salesman/consultant will have hidden connections with hardware suppliers that are not revealed to clients.)

As a rule, the client can determine for himself the need for additional services that a consultant may recommend. The validity of hardware recommendations may not be as obvious, particularly if the consultant from Firm A recommends the products of Firm B.

How can the client tell if he is about to engage an objective consultant or a salesman/consultant? It's simple. Ask the consultant to include in his proposal an assurance that neither he nor his firm will benefit directly or indirectly from third parties with respect to recommendations made to the client.

Here are some simple rules for selecting consultants:

- To perform a well-defined one-time task that the in-house staff can't handle, hire *contract employees*. Follow the usual guidelines in selecting the contractor, writing the contract and monitoring performance.
- To buy a turnkey installation of hardware, such as a fire suppression system or a special-purpose minicomputer that cannot be engineered in-house, hire a *salesman/consultant*. Ask for preliminary proposals to get a measure of price competition and check references to ensure good performance.
- To get objective advice and special expertise, engage a *professional consultant* who will certify his objectivity. Note that "professional" implies responsibility for the correctness of recommendations and training in a special body of knowledge.

Be wary of self-proclaimed professionals. Check references carefully. Avoid lengthy engagements until mutual trust and confidence have been established.

In short, be clear as to exactly what kind of consulting services you need and then act accordingly.

Jacobson is president of International Security Technology, Inc. in New York City.

READER COMMENTARY/Norman L. Wilson Jr.‡

Game War in the Courts: 'Munchkin' vs. Pac-Man

With thousands of companies spawning thousands of computer programs in a legal environment inadequate to protect them, the Supreme Court may feel compelled to divert some of its attention from social and political questions to computer issues.

In fact, the Reagan administration has proposed that Congress postpone action on home-taping of television shows until the Supreme Court decides the "Betamax" suit.

The justices may even find themselves playing computer games. What better way to decide a computer game case? The high court has been asked for guidance through the video game maze in Atari Corp. vs. North American Philips Consumer Electronics Corp.

'K.C. Munchkin'

Atari instituted an action for copyright infringement and also for an injunction preventing the further sale of the "K.C. Munchkin" maze-chase game. Atari based its action on the similarity of K.C. Munchkin to its own "Pac-Man," both of which guide a gobbler through a maze.

The District Court for the Eastern District of California in Fresno denied Atari's motion for an injunction prohibiting the sale of K.C. Munchkin. The U.S. Court of Appeals, however, disagreed. Hence the request of the Supreme Court.

For a better understanding of the appellate court's decision, let's look at the three available forms of protection for software. These are patents, trade secrets and copyrights. The law on the patentability of computer programs, like many of the games, is puzzling. By establishing different requirements, the U.S. Patent Office and the courts appear to have taken different routes to the solution of the puzzle.

As a consequence, patentability of computer programs apparently can be best accomplished by presenting carefully drawn patent claims.

Trade secret law is ineffectual because the underlying commercial purpose of computer programs militates against their being held as secrets. It would be idealistic to assume that algorithms that are in the marketplace for profit can be maintained in secrecy.

Copyright protection has never been highly recommended for the protection of computer programs. We inevitably find ourselves faced with the tenet that a copyright does not afford protection against the borrowing of abstract ideas contained in the copyrighted work.

All three forms of software protection miss the target. Hence, we must depend upon the courts to extend the boundaries of existing doctrine. One such boundary is that of "substantial similarity" in copyright law, which the Supreme Court has been asked to examine in the Atari case.

To exemplify this "substantial similarity" issue the appellate court in the Atari case considered a prior case involving a copyrighted jeweled pin in the shape of a bee. Obviously

(Continued on Page 38)

HUMAN CONNECTION/Jack Stone‡

A Stress Test for the Data Center Manager

It's hard to imagine a more agonizing moment for a data center manager than when a user cries out for a major new system in a time of business crisis, but the center is swamped with development tasks and he is forced to answer with a pathetic "Sorry, pal. Try giving us a call back sometime in early '84."

Even more painful experiences lie in wait if the user threatens to complain to top management — and the center gives in to the pressure.

This situation can result in a chaotic scenario well known in DP circles: The center is driven to defer systems development projects A and B in order to release key DPers for work on new system C; users served by A and B become irate because of the delays; and system C, having been developed in a crash environment, is late or over budget or poorly done, making its users miserable.

Search for a Policy

Stephen Roberts, who heads up the administrative systems development group at Catholic University of America (CUA), was resolute in his search for a policy that would give him reasonable control over user demands and allow the center to provide a balanced level of responsiveness, while at the same time letting him reject unwarranted system change requests without antagonizing the users altogether. Here was his approach:

This is Part 15 of a continuing series on how to succeed as a data center manager.

"During past years, our center was highly responsive to our users, taking on almost every systems task that came in the door. As you can guess, our operation was something of a madhouse because we were working at the mercy of a stream of unforecasted user demands. We finally figured out that we were mistakenly addressing the issue of which business procedures *could* be computerized, instead of which ones *should* be computerized.

"Further, we determined that the decision to automate should not be based on the whims of a nervous user, but on first, what is best for the user department and the university overall, and second, what the center has available in the way of developmental resources.

"Moreover, we concluded that these decisions must be made, but for us to have the capability to make them, we needed in-depth knowledge of the internal operations and DP needs of each administrative department, plus a solid understanding of the goals, objectives and policies that govern university operations.

"We finally learned the 'business' of university administration, but only after working hard and long at it: spending a considerable time in departments, studying their operations; listening to briefings on user systems from our analysts; studying publications of and news developments within the university community; and generally maintaining regular communications with user management, particularly in problem areas.

"It was also essential, from a political vantage point, that we be able to perceive the needs for system projects early on and not wait for users to tell us about them.

"Along with this ability, we wanted to determine project priorities throughout the university. The background of knowledge about our users has given us the competency we needed. In fact, we present our recommendations on these projects to top management at quarterly sessions — devoted solely to DP — and our views are usually accepted because we understand and communicate at this level as senior managers and not as computer systems technocrats.

"These meetings also testify to the progress made toward one of our major goals for the center: to be viewed by all across the campus as a fully contributing member of the university management team.

"Our management capabilities have grown to where we now evaluate our requests on the basis of their cost/benefit merits alone and delay or reject unjustifiable ones without causing a user revolt!"

More information on the CUA program can be obtained from Stephen Roberts, Assistant Director, Computer Center, The Catholic University of America, Washington, D.C. 20064.

SEE PAGE 63

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LETTERS

Fending Off Headhunters

After reading Donald J. Berardo's "What to Do When a Headhunter Calls" [CW, June 28], it seems as though the article did not really explain what the title implies. There are quite a few other actions and remedies possible when an unethical headhunter really gets in your hair.

We have had all the types of calls mentioned in the article and more, including: "I just witnessed a car wreck and it was the mother of one of your programmers. Could you tell me what their names are?" And "Somebody hit me in the parking lot and left a note on my car, but I couldn't read anything other than the business address." But there are ways of dealing with these individuals.

The article is correct in pointing out that all secretaries and other personnel who answer the phone should be on the alert for such tactics. Additionally, Berardo is also correct in saying that employees should be reminded that it is against company policy to talk to headhunters on company time. But this can be taken a couple of steps further.

Most loyal employees in an organization resent attempts by outsiders to break up a smoothly functioning group; for a manager this can be a means of coping with headhunters. Using a few loyal employees who are willing to give their names in exchange for an interview it becomes possible to positively identify both the headhunter and the company for which he works.

Another tactic that helps minimize the impact of headhunters is to conduct a staff meeting wherein each of the enticements and promises that are typically laid out by an unethical headhunter can be more thoroughly discussed.

For example, statements made by headhunters offering a challenging environment can be countered by detailing to the programming staff the goals and objectives of their own shop. Similarly, promises of large sums of money can be countered by reviewing the company's promotions, salaries and other benefits.

It is usually not sufficient to merely confront a sneaky headhunter on the phone as he will usually lay low for a while and then begin his tricks all over again. It is important to find out the firm for which the headhunter works. Most large firms are acutely aware of the need to maintain a good reputation. The managers of such firms will take quick action on any headhunter that is practicing unethically. Secondly, make sure that your comments and complaints are put in writing to both the headhunter and his boss.

Another means of getting relief from headhunters is to take advantage of some of the data processing organizations in town. Chapters such as the Data Processing Management Association usually allow associate memberships for outfits such as personnel agencies. This is an excellent place to either confront the offending headhunter or to inform all of the other employment agencies that are present of the tactics being used by the headhunter.

The DP organization is also a good place to get up and publicly blast the offending headhunter. In some cities employment agencies also have their own associations. It is also appropriate to write letters of complaint to these associations asking for redress of grievances. Occasionally this will work.

If the headhunter problem is particulary acute there are additional avenues available. Publicity in the newspaper will sometimes work, particularly if the company being raided is in the eye of the public. For example, public utilities and municipal governments are constantly being pressured to keep expenditures to a minimum and this could be used to good advantage when it is pointed out that headhunters tend to drive up the cost of operation.

Lastly, a law suit could be filed if it could be shown that the headhunter is doing grievous harm to a corporation's business.

Perhaps the best way to avoid the headhunter dilemma is to maintain ongoing communications with individuals who hire in all different sorts of industries. Through this grapevine it becomes possible for everybody to become aware of an offending headhunter and not do business with him, while at the same time recognizing the right of legitimate employment agencies to do business.

Wayne V. Herbert
Assistant Director
Harris County Data Processing
Houston, Texas

'Munchkin' Vs. Pac-Man

(Continued from Page 37)

many bee-shaped pins can be made. But the copyright owner disavowed a claim to these jeweled bee pin ideas, seeking to protect only his particular design or "expression" of a bee pin.

With this bee pin doctrine in mind, the court in the Atari case began its comparison. "K.C. Munchkin," it said, "not only adopted the same characters, but also portrayed them in a manner which made K.C. Munchkin appear substantially similar to Pac-Man.

"Although not 'virtually identical' to Pac-Man," the court continued, "K.C. Munchkin 'captures the total concept and feel' and is substantially similar to Pac-Man."

The court concluded that this was not a case where only the idea of the game was adopted. The appellate court seemed to feel that the game's own unique form of expression was also utilized. Since currently most of the world's knowledge appears to be stored in random-access memory or read-only memory, protection of computer software seems to demand a new body of law. How far the court will extend existing boundaries in its absence remains to be seen.

Years ago, Judge Learned Hand observed, "Wherever the line is drawn will seem arbitrary."

Wilson is a patent attorney based in St. Louis, Mo.

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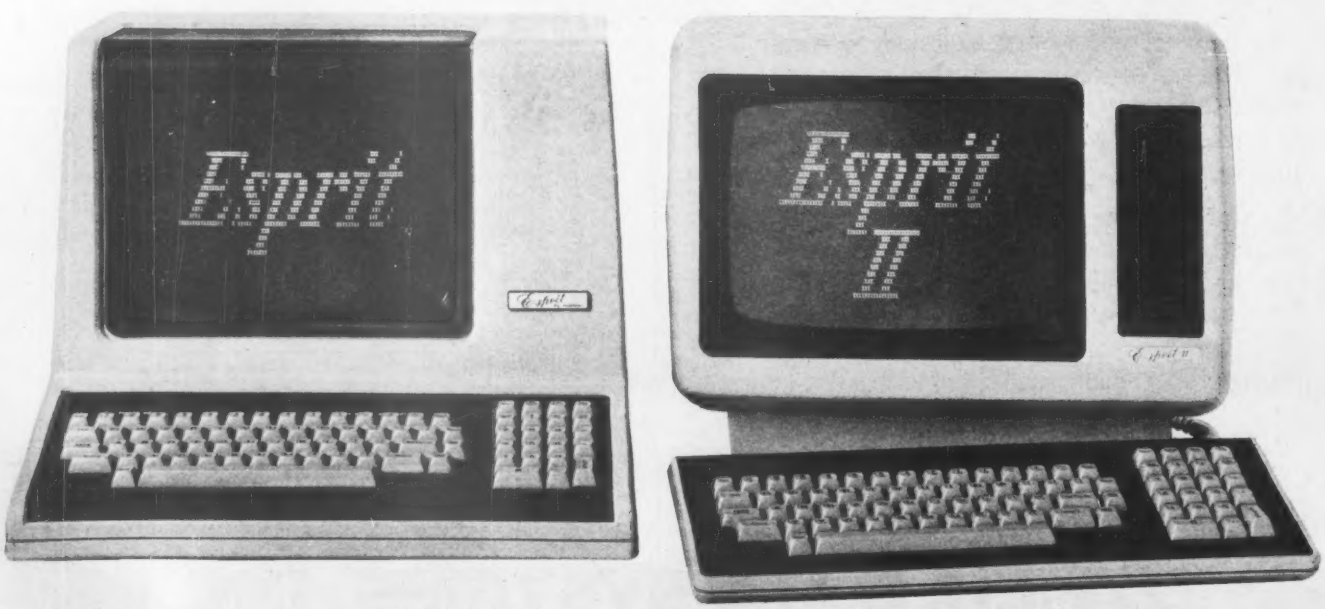

Ada Compiler, Utilities Out For IBM, DEC

By Bob Johnson
CW New York Bureau

NEW YORK — An Ada compiler for IBM and plug-compatible mainframes running under VM/CMS and a programming support environment (PSE) for Digital Equipment Corp. VAX series computers were announced here recently by Telesoft, Inc.

The Telesoft-Ada compiler for the IBM system, which the company said is part of its Telesoft-PSE system, reportedly provides a variety of Ada packages and utilities. This includes standard Ada text-I/O and generic-I/O packages and runtime support primitives to support Ada operations such as tasking and exception handling.

The company stated that the implementation of Telesoft-PSE on IBM VM/CMS systems is achieved by use of an interpreter that produces a compact code that is then translated to native code at the time of execution. The interpreter automatically utilizes a 1M-byte partition, thus allowing the running of large programs, Telesoft said.

The VM/CMS Kit, which Telesoft said is the minimum set of components recommended for Ada use on IBM 370-compatible systems, costs $11,065 and is immediately available.

Telesoft also introduced the Telesoft-PSE for DEC VAX computers, which reportedly includes the Ada compiler, Ada operating system environment, operating system function package, Ada runtime support package, standard and advanced development utilities, screen-oriented editor, VAX native code translator and documentation. The VAX kit costs $9,930.

More information can be obtained from Telesoft, 10639 Roselle St., San Diego, Calif. 92121.

Modeled After IBM's 'SPF'

Facility Tests IBM Assembler

SUNNYVALE, Calif. — A full-screen testing and debugging facility for IBM assembler programs that reportedly is modeled after IBM's System Productivity Facility (SPF) was announced here by Boole & Babbage, Inc.

The Extended Productivity Facility/Test (XPF/Test) is said to operate on the assembly language level on IBM 370 and plug-compatible computers as a command processor under the MVS operating system in a TSO environment. It was designed to test programs written in assembler, as well as compiled programs written in any language, Boole & Babbage explained.

The software reportedly provides a structured testing environment in which a programmer can control the execution of application programs and correct resultant errors.

The first of what Boole & Babbage said will be a family of XPF software products, this package extends IBM's SPF capabilities into the area of program testing and debugging. It also provides the full-screen, interactive capabilities of an IBM 3270-type terminal for program testing and analysis.

Eliminates Program Dumps

The software is said to eliminate the need for program dumps and to enable all testing and debugging to be accomplished on the terminal screen. Programmers can correct errors during the test session.

After a program has been coded and is ready for testing, XPF/Test's test control entry panel is used to load the program for execution in the XPF/Test environment, the vendor explained. When an error occurs during the test run, the package's intercept panel displays the program status word, registers and memory contents at the time of abend.

Using XPF/Test's split-screen mode, the programmer reportedly can browse through the source listing of the interrupted program and modify program specifics by overtyping the hexadecimal or character displays.

Other XPF/Test features include breakpoint control panels to display, delete or suspend temporarily the use of a breakpoint; virtual storage management facilities; full browse capabilities with specific FIND commands; and symbol creation and management panels to view available program symbols and to add or delete symbols from the symbol table.

In addition, the package includes the ability to test SPF dialog manager programs; memory management options to display, map, copy, allocate or release main storage; the ability to control utilities from within the testing environment through direct use of TSO commands; and data set allocation and deallocation capability, according to the vendor.

A one-year, single-CPU license for XPF/Test is $8,000 per site; additional CPUs at the same site cost $2,000 each. Annual licenses can be renewed at a cost of $5,000 for the first CPU and $1,250 for each additional CPU.

A free 30-day trial of XPF/Test is available from the firm at 510 Oakmead Pkwy., Sunnyvale, Calif 94086.

SDA Unveils Source Code Processor

NEW YORK — Cobol Rx, a source code processor designed to ease the maintenance phase of software development efforts, was announced here by SDA Products, Inc.

Intended for use on IBM and plug-compatible systems running under OS and DOS, Cobol Rx is said to reformat and standardize programs to improve readability after they have been written. It was designed for use by the programmer as the last step in the development process.

The vendor said Cobol Rx permits even a junior-level programmer to scan the code rather than absorb in detail the particulars of any program or system for ongoing maintenance. It also can be run independent of the programmer, as a quality-assurance tool.

Cobol Rx is comprised of a set of options, each with a default value, which reportedly allow customization of the program for each shop's particular standards. Its capabilities include the processing of shorthand code, conversion from one compiler to another and expansion of Cobol macros.

The package will accept a full program and a stand-alone code sequence, such as data descriptions of subroutines. It is said to reduce errors and omissions by the consistent use of reserved words, code separation, alignment and indentations and paragraph numbering.

Additional features include indentation and alignment of verb and subordinate statements and resequencing of output statements.

The introductory price for Cobol Rx is $4,500 for a three-year license, including maintenance. The tape and documentation and installation instructions can be ordered from SDA Products, 71 Fifth Ave., New York, N.Y. 10003.

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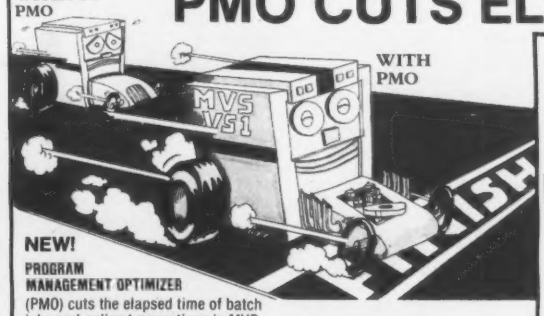

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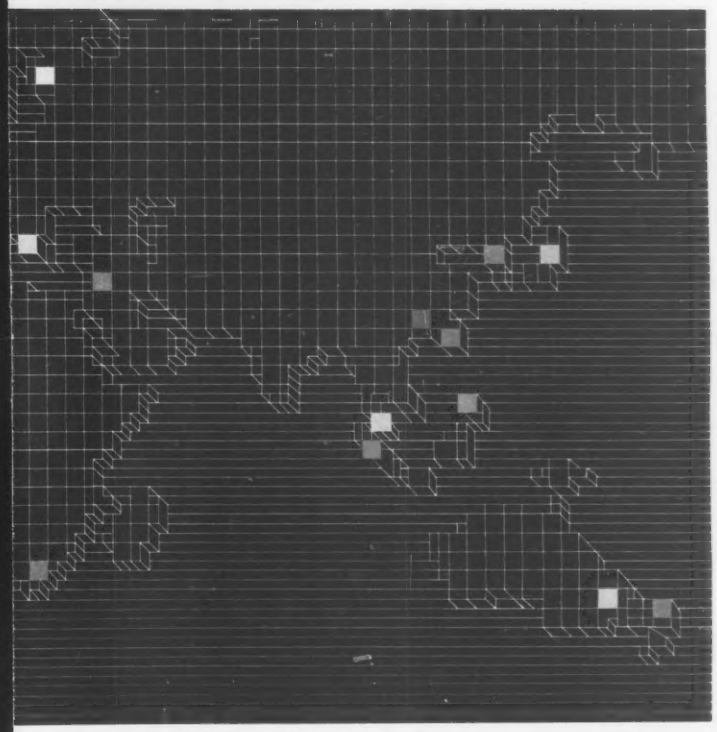

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'Pass/Accupay' Version Integrated With Software AG's Adabas DBMS

CONSHOHOCKEN, Pa. — Personnel Data Systems, Inc. has announced that its Pass/Accupay payroll/personnel package is now available under Software AG's Adabas data base management system, written in the latter vendor's Natural programming language.

The version of Pass/Accupay that is integrated with Adabas runs on IBM and plug-compatible mainframes under OS and DOS, the vendor said. It reportedly is a single-file system, with on-line, real-time and interactive capabilities. Pass/Accupay is said to support up to 256 sort keys.

The software's payroll component handles functions of payroll processing from gross to net and net to gross, as well as full government reporting requirements. Its personnel component was designed to handle equal employment opportunity reports. The software is intended for multicompany and multidivision processing.

Personnel Data Systems will be marketing the Adabas-based Pass/Accupay package to both current users of Adabas and new users. For current users, the Pass/Accupay software is available for $130,000. For nonusers, both Adabas and Pass/Accupay can be purchased for $160,000. Both prices include documentation, source code and installation, the vendor said from 15 E. Ridge Pike, Conshohocken, Pa. 19428.

Program Generator Debuts For Use on IBM Datamaster

KNOXVILLE, Tenn. — An applications program generator for users of the IBM System/23 Datamaster was announced here by Creative Software Development, Inc.

Megacode A.G. (application generator) is said to create stand-alone programs with standardized subroutines throughout. It includes basic routines for defining, opening and maintaining files; sort procedures; reports from keyed files or file-sorted keys; creation of menus; file-sort programs; multifile processing; and internal and external file specifications, the vendor explained. Maintenance screens and file formats also are created, according to a vendor spokesman.

The programmer or operator keys in basic information regarding file and report specifications, menu or sort requirements for single or multiple files and uses Megacode A.G. to developed the programs, according to the vendor.

The software is priced at $1,700, the vendor said from 6709 B Kingston Pike, Knoxville, Tenn. 37919.

'Top Secret' Adds CICS Support

VANDALIA, Ohio — The extension of IBM CICS support to files, journals, programs, destinations and temporary storage reportedly has been added to Version 2.0 of Top Secret, a software security package from CGA Software Products Group, Inc.

Top Secret runs on IBM and plug-compatible systems under MVS and features support for Applied Data Research, Inc.'s Roscoe; an IBM random-access control facility co-existence option during conversion; and modes extended on a facility basis, according to the vendor.

The product costs $700/mo for the first CPU and $350/mo for each additional CPU, according to a vendor spokesman. CGA Software is located at 212 W. National Road, Vandalia, Ohio 45377.

Graphics Tool Tied to Ramtek

BOULDER, Colo. — Precision Visuals, Inc. has introduced device drivers designed to enable users of the firm's DI-3000 graphics software package on a variety of minicomputers to take advantage of the hardware and firmware features of the Ramtek Corp. 6211 and 6212 color raster terminals.

The drivers reportedly can be used for a range of applications, including computer-aided design and business and engineering graphics. Input devices supported by the drivers include the terminal cursor, light pen, tablet and keyboard function keys, the vendor said.

The drivers use the Ramtek terminal's firmware algorithm for rapid fill complex polygons as well as their binary transmission of vector data over an RS-232C interface, the vendor explained. They reportedly support eight concurrent colors. Other supported features include hardware line styles, marker symbols and text capabilities for the development of business graphics. The drivers also support four character sizes on the Ramtek terminals.

The Ramtek 6211 and 6212 drivers are available for installation on all computer systems supporting DI-3000, including systems from Prime Computer, Inc., Digital Equipment Corp., Hewlett-Packard Co., Data General Corp. and Control Data Corp., among others.

Annual licenses for the drivers are $500. A 25-year license starts at $8,000 from the vendor at 250 Arapahoe, Boulder, Colo. 80302.

File Encryption Utility Out For IBM VM/CMS Systems

PRINCETON, N.J. — A file encryption utility designed for use on IBM and plug-compatible mainframes running under VM/CMS was announced by The Princeton Software Co.

Secure/CMS reportedly appears to the user as a new CMS command, enabling the user to perform encryption or decryption on any CMS file. The command syntax for the software is said to be consistent with other CMS commands such as COPYFILE.

A number of options are included in the software to provide key management capabilities, the vendor said. The encryption/decryption key can be obtained from several sources, such as the user console, the option list, or by using the FILE option to obtain the key from a specified location in an arbitrary CMS file. Additionally, the SPLIT option can be used to obtain pieces of the encryption/decryption key from different sources.

Multiple modes of encryption are provided, including standard Data Encryption Standard (DES) encryption and a FAST encryption option. The DES encryption modes reportedly have been modeled after the vendor's Data Security Facility, which it claims is able to encrypt over 50,000 byte/sec on an IBM 3081.

Other features of Secure/CMS include the clearing of all residual key and plaintext data and key verification options for added security. All encryption is performed in-place internally, the vendor noted.

Permanent licenses for Secure/CMS are available at an introductory price of $500 for the first CPU. Multiple CPU discounts are available, the vendor said through P.O. Box 1317, Princeton, N.J. 08540.

'Sysm II' Gets Activity Monitor

BOISE, Idaho — H & W Computer Systems, Inc. has added an activity monitor to Version II of Sysm, its IBM CICS Electronic Message Distribution System.

This product offers the capabilities of electronic mail, automatic message distribution and broadcasting, optional hard-copy printing and multiple levels of security, according to the vendor. It was designed to run on IBM and plug-compatible mainframes running under DOS/VS(E), VS1 and MVS with CICS/VS release 1.4 and 1.5. It reportedly can be operated by administrative personnel not trained in DP.

The perpetual license of Sysm II is $8,500, which includes source libraries, support and 12 months of maintenance. H & W Computer Systems, Inc. can be reached through P.O. Box 4173, Boise, Idaho, 83704.

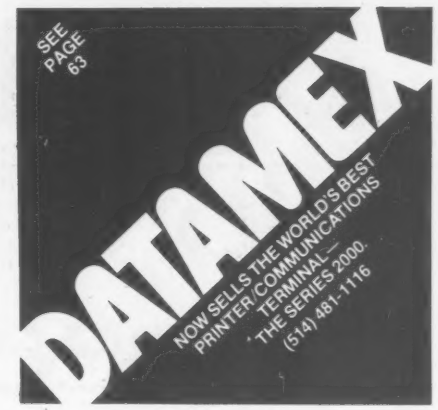
Law Office Package Runs on DEC Systems

BEAVERTON, Ore.— Alpine Datasystems has unveiled its new Legal Management Systems, a package designed for law firms with 10 or more attorneys.

The package reportedly runs under CTS 30, the operating system for DEC's Datasystem family of small business computers, and under RSTS, the operating system for the DEC PDP-11. It is menu driven and was designed for the multiterminal environment.

The package is a complete timekeeping, billing, accounts receivable and management reporting system with general ledger, accounts payable, payroll and word processing and communications options, according to Alpine.

Alpine is located at 8043 S.W. Cirrus Drive, Beaverton, Ore. 97005.



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Screen Editor Debuts For HP 3000

ST. LOUIS — Computer Consultants & Service Center, Inc. has introduced a character mode screen editor for Hewlett-Packard Co. HP 3000 computers.

Tess/300 is said to provide access to files and avoid redundant editing operations. The most frequent editing tasks are performed through 64 control key commands, a vendor spokesman said.

In addition to the editing features, the package also offers pattern matching, smart tabbing, line indenting, user-customized commands and program compilation.

Tess/300 reportedly transfers only the necessary characters that have been changed, unlike a block-line editor. Feedback to the user is immediate, a vendor spokesman said.

The package is priced at $2,400, which includes a tape, manual and tutorial. It will support all HP 2300, 2600 and similar terminals. More information is available from Computer Consultants & Service Center, 2711 Olive St., St. Louis, Mo. 63103.

'Sims-I' System Development Tool Runs on DEC PDP-11 Systems

ST. PAUL, Minn. — Sedna Corp. has announced the commercial availability of its system development package, Sims-I, which is intended for users of Digital Equipment Corp.'s PDP-11 series.

The vendor describes Sims-I as a fourth-generation code generator because it reportedly uses no compilers and requires no program code at any stage of the development of systems.

Sims-I was designed to achieve complete separation of physical and logical files, to accommodate the various physical file types equally well and to permit the designer to pursue optimization along any path or set of preferences, the vendor said.

Once Sims-I is loaded, it reportedly requires no support from manufacturer-supplied operating systems. It includes its own scheduler, interrupt service routines, I/O drivers and utilities and is said to reside in fewer than 50K bytes of core memory.

The Sims-I package is priced between $60,000 and $135,000, depending on the configuration. The software is available on the PDP-11 series up to the PDP-11/70. Further information on Sims-I can be obtained by contacting Sedna Corp. at 2380 Wycliff St., St. Paul, Minn. 55114.

Two Packages Out for NCR

CINCINNATI — Software Clearing House is marketing two software packages for NCR Corp. systems running the Imos, IRX or VRX operating systems.

Produced by Datamate Co., the Datamate package is a report writer that reportedly can generate customized reports without special programming. The package runs under the Imos II, III, V and IRX operating systems and costs $4,000 for Imos and $5,000 for IRX, the vendor said.

Finanswer is an electronic spreadsheet system designed for Imos, IRX and VRX operating systems. The package is said to be compatible with existing NCR CRT terminals and printers, requires 20K bytes of memory and less than 83 sectors of disk space. It costs $995, the vendor said from 771 Neeb Road, Cincinnati, Ohio 45238.

Three Accounting Modules Run on Prime Minis

PARSIPPANY, N.J. — Pulsar Systems, Inc. has released three modules of an on-line accounting application software for Prime Computers, Inc. minicomputers. All three are said to handle data entry via video display terminals and to provide for immediate validation and correction of input errors.

The accounts receivable package features 19 user-definable deduction types, invoice entry allowing for credit and debit memos, aging with automatically generated service charges at period end, multiple sort options on every report, on-line inquiry with hard-copy listing available for each inquiry and month-end closing using a parameter-driven internal fiscal calendar.

The accounts payable system features include multibank handling disbursements through 10 banks, accounts and full check reconciliation.

The general ledger package is said to be fully integrated with Pulsar's other two modules and features up to 15 periods of actual and budget information for both current and prior fiscal years.

Each module costs $7,500 and is available from Pulsar Systems, Inc., 1259 Rt. 46, Building 2, Parsippany, N.J. 07054.

Four Performance Monitors Unveiled for DEC Machines

MILWAUKEE — Computing Techniques, Inc. has announced four performance and monitoring packages for users of Digital Equipment Corp. PDP-11, LSI-11 and VAX processors.

A Fortran subroutine for accessing virtual arrays reportedly allows arrays to be defined dynamically when a program begins checking. The package costs $175, the vendor said.

A file usage and ownership routine is intended to keep track of disk space and usage. The package allows the system manager, as well as users, to police their file usage. It costs $350, the vendor said.

An accounts billing package for users of S&H Computing Co. TSX and TSX+ transaction-oriented operating systems, which run under DEC's RT-11 operating system is available to compute connect time, CPU usage and detached run activity, the vendor said. The package costs $95.

A rastor converter package, which converts vector coordinates to rastor outputs for matrix graphics printers, is available for $850, the vendor said.

The firm also announced it has lowered the price on its Cted text editor to $950. Computing Techniques can be reached through P.O. Box 14127, Milwaukee, Wis. 53214.

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Smalltalk-80 Runs on Xerox 1100

EL SEGUNDO, Calif. — Smalltalk-80, a software package described by its developer as a programming language-operating system [CW, July 12], has been released here by Xerox Corp. to run on its 1100 scientific information processor.

The software includes graphics capabilities and interactive support, is object-oriented as opposed to procedure-oriented and has user interfaces, according to a vendor spokesman.

With Smalltalk, data is represented by a single entity — the object — which represents both the information and the procedures for its manipulations, the vendor explained. This organization is modular and reportedly makes for simple programming.

The bit map-based graphics in the Smalltalk-80 system include support for several different fonts, line drawings, menus, half-tone shadings and multiple display windows. The programming interface includes support for browsing, editing and debugging of applications software, according to the vendor.

The purchase price of the Xerox 1100 scientific information processor is $59,000. The license fee for Smalltalk-80 is $5,000. Xerox Corp. can be reached at 701 S. Aviation Blvd., El Segundo, Calif. 90245.

'Vsammap' Upgrade Aids Key-Sequenced Data Sets

PURDYS, N.Y. — Roy-Josephs Associates, Inc. has released Version 1.2 of its Vsam productivity aid, a mapping/printing utility for Vsam key-sequenced data sets. It is intended for users of IBM and plug-compatible mainframes.

Vsammap 2 reportedly provides a breakdown of each control area in a key-sequenced data set and outputs an in-depth printout containing information on control intervals/control area split indicators, amount of actual free space in each control interval and control area and high-key, number of records and average and maximum record length in each control interval. It also indicates potential problems in data base structure, according to the vendor.

The Vsammap 2 print function is intended as a replacement for IBM's Access Method Services print function. The lease license fee is $3,500 for the first year and $720 for subsequent years. Roy-Josephs is located at 300 Pkwy., Purdys, N.Y. 10578.

'VZplan' Out For DEC, HP

VANCOUVER, B.C. — Canadian European Systems Ltd. has introduced a visual planning and reporting software package for users of Hewlett-Packard Co.'s HP 3000 as well as Digital Equipment Corp.'s PDP-11 and VAX-11 computer systems.

VZplan can reportedly be used as either a stand-alone package or in conjuction with the company's Dainev software, an integrated planning and reporting system. VZplan offers visual planning for spread sheets of 100 rows by 60 col and combines the ease-of-use of a menu-driven system with a simple command structure for visual planning and modeling.

The license fee for VZplan is $1,250, and further details can be obtained from the vendor through P.O. Box 2884, Vancouver, B.C., Canada V6B 3X4.

Burroughs Gets 'SPSS' Package

CHICAGO — SPSS, Inc.'s SPSS package is now available for small Burroughs Corp. processors.

Used for statistical analysis, tabulation, report writing and general-purpose data management, the package can be used by Burroughs 1700, 1800 and 1900 users for more than 40 procedures.

The package costs $7,000 for the first year and $3,500 for succeeding years including updates, maintenance and access to a technical hotline, the vendor said from 444 N. Michigan Ave., Chicago, Ill. 60611.

Packages Bow For IBM 8100

CUPERTINO, Calif. — DPX, Inc. has announced two software packages designed for IBM 8100 users in the U.S. and Canada.

Rode/DPPX was designed for users of DPPX operating systems, and Rode/DPCX is intended for users with DPCX operating systems, the vendor said.

Both reportedly provide data entry capabilities in stand-alone and distributed 8100 environments and are said to allow bulk or source data entry to run concurrently with other 8100 functions.

All Rode functions are menu-driven, according to the vendor.

These packages costs $7,500 each, the vendor said, and DPX is based at 10902 Northfield Sq., Cupertino, Calif. 95014.

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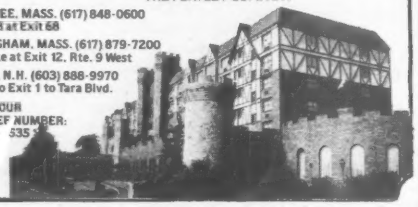

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As DP Payroll Costs Spiral

Performance Measurement: A Necessary Tool

By Ralph L. Kliem
Special to CW‡

Data processing costs in most companies are climbing with no end in sight. A significant contributor to these escalating costs are salaries and wages.

Programmer salaries, for instance, are increasing rapidly because the demand for highly skilled programmers is greater than the supply. But salary costs of programmers are not the only contributing factors to this "wage/price spiral."

The payroll costs of administrative personnel in DP departments, such as those relating to data entry and administrative support, are also rising. This is especially the case where companies need to hire increasingly intelligent and capable employees to work with advanced data and word processing systems.

It behooves management, therefore, to devise and implement an objective tool for managing, measuring and evaluating employee performance to determine if productivity is maintaining pace with rising payroll costs. If you happen to be a methods analyst or a manager of a DP department, work measurement may very well be the tool for you.

Work measurement can be a useful tool for analyzing and evaluating employee and organizational performance.

The First Step

The first step in a work measurement project is a time study that relates input to output in terms of time spent on the job. The time study is intended to develop standards of performance in order to evaluate future activity or to establish objectives.

Because no predetermined standards exist, the analyst's concern will be with historical techniques, such as the time-ladder approach and work sampling.

The time-ladder approach is a simple but effective way to develop standards. Everything you do starts from scratch. The following four steps are involved in this approach:

• Preliminary analysis: This is the investigative phase in which the analyst seeks to understand the purpose of a unit's operation and determines if the method used is improvable. In addition, the analyst determines the best unit of measurement to quantify output or performance.

• Recording the standard practice: The analyst accomplishes this by reviewing work flows and procedures of a unit, knowing the job descriptions of employees and ascertaining methods of record keeping.

• Recording the time values: The analyst constructs a time record and, based on this data, determines the standard of the day. The use of the mean, median or mode can assist the analyst in accomplishing this purpose.

• Computing the standard: Finally, the analyst must compute the standard time, which indicates how long a given rate of work input must be maintained to produce a unit of output.

The next step in work measurement is work sampling, which is a technique used to study a large number of people. It involves taking a small number of random observations that follow the same distribution pattern as that of a large number. From these observations, the performance level of a group of employees can be determined.

The basic steps of work sampling are as follows:

• Define the problem and determine just what is going to be observed.

• Consider the sample size.

• Gather all pertinent information by determining the activities to be performed and the number of people to be observed.

• Develop a work sampling observation sheet.

• Determine the time, frequency and number of observations.

• Develop a form that will show the daily and composite percentage of the occurrences of observations.

• Summarize the observations and compute the standard. To do this, the analyst records the number and percent of observations, the total time in minutes and the number of work units. The time in minutes is divided by the number of work units to get the standard or unit time.

Performance Rating

Once the standards for normal performance are obtained, the next step is performance rating. This technically is defined as the determination of the time required to perform a task by the normal operator after the values of the operation under study have been recorded. Performance rating can be used as a powerful tool to discover the reasons behind abnormal performance.

The three variables that should be considered are the following:

• Normal time, which is the standard developed in either the time-ladder approach or work sampling.

• Observed time, which is the time the analyst has determined that it takes for an employee to perform a given task or duty. It is actually an average rating, which is acquired by recording the performance of an employee several times, summing the recorded times and dividing the sum by the total number of observations. This is the way to compute the mean.

• Performance factor, which is computed by dividing the normal time by the observed time. Once this is determined, the analyst must consider if the performance factor is below normal, normal or above normal performance. Generally, someone with authority sets the standard that normal performance falls within a certain range. Any performance factor outside this range generally is considered abnormal performance for the group.

The next step is analyzing why certain factors impede the efficient and effective operation of a unit. These answers can be obtained by studying the abnormal performers and comparing their characteristics with the normal performers.

Nichols 'N5500' Gets Update for System/38

CULVER CITY, Calif. — Nichols & Company, Inc.'s N5500 Project Planning & Control System reportedly has been converted for use on the IBM System/38.

All N5500 data may be entered and reports retrieved on-line via the optional Nichols Interactive Entry & Retrieval System (Niers), according to a spokesman. The N5500 was designed to aid project managers in planning, tracking and documenting projects in DP, engineering, manufacturing, research, plant maintenance and construction.

N5500 costs $28,000 and Niers costs $10,000 from the firm at 5839 Green Valley Circle, Culver City, Calif. 90230.

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Software Duo for Minis Supports DG's Business Basic Language

ROLLING MEADOWS, Ill. — Two software packages for minicomputers that are said to support Data General Corp.'s Business Basic language have been released here by Compac Systems, Inc.

Wiseman is a Business Basic program code enhancer, which reportedly improves program execution speed and reduces user memory requirements. It allows users to upgrade programs to the various new features of Business Basic and documents all changes in programs, according to the vendor. It is priced at $995.

SPDutil is a set of development utility programs, which consists of three new tools for Business Basic users. SPDtab, a cross-reference program, and SPDvar, a cross-reference of variables and statements, were designed to improve speed within the minimum users' memory space.

Lineerr provides an automated method to verify line number usage, checking each statement in a Business Basic program and verifying the sequences, the vendor explained. This package sells for $195.

Further details can be obtained from Compac Systems at 59 E. Cunningham Drive, Palatine, Ill. 60067.

On-Line CICS Added to 'Zeke'

ARLINGTON, Texas — An IBM CICS on-line interface and a VM/CMS interface have been added to Release 1.1 of Southwest Software Services, Inc.'s Zeke-The Controller automated scheduling and dispatching system.

This product currently operates on IBM and plug-compatible systems in a DOS/VSE and VSE/Power operating environment, according to the vendor.

The new on-line CICS facility reportedly enables the user to build, update, browse and display the data base interactively. Menu screens and fill-in-the-blank screens aid the user in these processes, the vendor said.

A permanent license fee for Zeke-The Controller costs $5,000. Southwest Software Services is based at 3602 E. Randol Mill Road, Arlington, Texas 76011.

Radiology Package Introduced by DEC

HUDSON, Mass. — Digital Equipment Corp. has introduced a software package designed to manage the activities of hospital and clinical diagnostic radiology departments. The Decmed Radiology System is a seven-module package that runs on the DEC VAX-11/780 and VAX-11/750 under VMS.

The seven modules consist of patient registration, examination scheduling, patient tracking, film library management, diagnostic reporting, accounting and management reports.

The package is available for a single license fee of $60,000 from DEC, 129 Parker St., Maynard, Mass. 01754.

Financial Tool Out For Honeywell Minis

HANOVER, N.H. — Lupfer & Long, Inc. has announced Spread, a financial analysis and reporting package for Honeywell, Inc. DPS 6 minicomputers.

The package features goal-seeking, financial functions, external file handling and consolidation, the vendor said.

The package costs $16,000 and runs in 45K words of memory under Honeywell's Gcos Mod 400 operating system.

The package also runs on Honeywell Level 66 mainframes. The vendor can be reached through P.O. Box 135, Hanover, N.H. 03755.

'Construction Management' Targets IBM System/34 Users

PHOENIX — Computer Guidance Corp. has introduced a software product for construction companies using IBM's System/34.

The Construction Management System (CMS) is composed of seven financial and cost-control systems, according to the vendor.

It is reportedly user-friendly, with on-line entry, edit and update functions.

The system maintains a history of most detail transactions. Features include a general ledger, job costing, vendor invoices and payments, material receipts and contract billing and payment capabilities.

For organizations having multiple companies or divisions, CMS provides financial reporting and computer security by company and division as well as by application, the vendor said.

Each of the CMS applications can be installed individually or as part of an integrated accounting and cost-control system.

Applications are available for a one-time license fee, which includes training, on-site installation assistance and telephone support.

Pricing per module ranges between $3,000 and $5,000.

The complete CMS package is available for $24,000, a spokesman for Computer Guidance Corp. said from 2301 E. Shea Blvd., Phoenix, Ariz. 85028.

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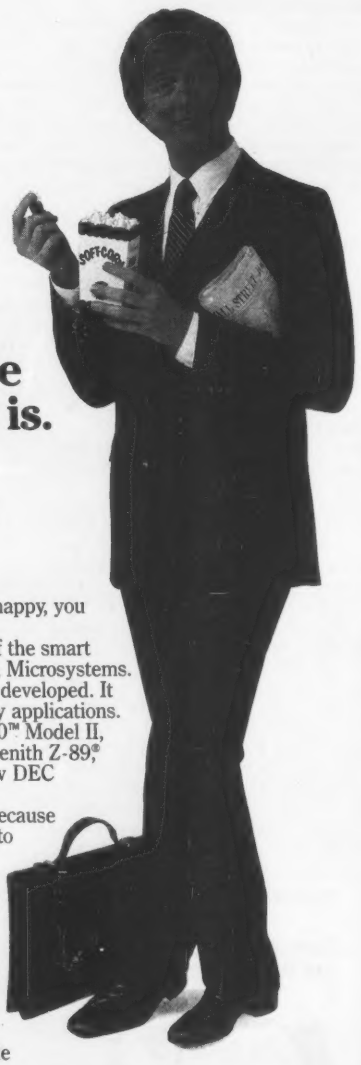

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Security Package for HP 3000 Gets Enhancements

LOS ANGELES — A software package designed to provide security for the Hewlett-Packard Co. 3000 series has been enhanced by its developer to afford an additional level of protection.

Unlike the release that preceded it, the latest version of Vesoft Consultants, Inc.'s Security/3000 package reportedly controls access to accounts and programs by logical device number, day of week, time of day and session name.

This added capability allows users to sign on to systems only during regular business hours and prevents them from retrieving files through terminals that they have no legitimate reason to use, a Vesoft spokesman said.

By using session names to control systems access, the enhanced utility ensures each user a unique password, even in environments where several individuals share the same operator identification, the spokesman said.

Despite Security/3000's enhancements, the utility's price remains the same — $1,500. The package, which also includes a batch-oriented security aid known as Streamx at no extra cost, is available from Vesoft at 506 N. Plymouth Blvd., Los Angeles, Calif. 90004.

Virtex Software For NCR Adds Three Products

CINCINNATI — Three products developed by Bonnecaze, McLeroy & Harrison to augment its Virtex family of software products for NCR Corp. computers are available through Software Clearing House here.

Application Screen Painter (ASP) is a screen generator that works with such NCR conversational terminals as the Models 796-101 and 7901 and, when used in an application, is said to cause reductions in the amount of Cobol code written. ASP costs $2,200.

Dasys is a substitute for keypunch said to run on Applied Digital Data Systems, Inc. Viewpoint terminals and reportedly can be installed at existing Virtex sites for $3,200 or as a stand-alone version for $4,950.

Frame is a menu processing/security control system said to allow users to design a series of interlocking menus that control who can do what on the on-line system. Frame costs $2,200. Software Clearing House is located at 771 Neeb Road, Cincinnati, Ohio 45238.

Tape Library Out for Prime 50

HOUSTON — TWS, Inc. has announced the availability of an on-line Tape Library System (TLS) for Prime Computer, Inc. Prime 50 series systems.

TLS is a two-program system said to provide Prime users with a means to maintain control over tape files containing data or system backoffs. The library system is an interactive system utilizing the standard Isam file method. It produces a file ready for printing that can reflect all data stored in the library, according to the vendor.

This hard-copy report can be selective in almost any key sequence and be either in ascending or descending order. Complete library reports are available in user-selected sequences, along with a statistical summary of the library's contents, the vendor said.

TLS is available for a one-time license fee of $1,500 from TWS at Suite 180, 6400 Westpark, Houston, Texas 77057.

'Opticalc/3000' Runs on HP 3000

AUSTIN, Texas — Tymlabs Corp. has announced it is marketing a spreadsheet program for Hewlett-Packard Co. HP 3000 users that was designed by John McLean and Associates, Inc. of Houston.

Opticalc/3000 is said to expand the functions of electronic work sheet software. The package features a 264-row by 63-col work sheet, up to 255K bytes of memory, print command for fully formatted output to any device, autoinput command, dynamic memory allocation and the ability to run on all HP terminals, according to the vendor.

Tymlabs will provide full support for the Opticalc/3000, which sells for $3,500. A demo tape is available for $250, applicable to the purchase price. Additional information is available from Tymlabs Corp., 211 E. 7th St., Austin, Texas 78701.

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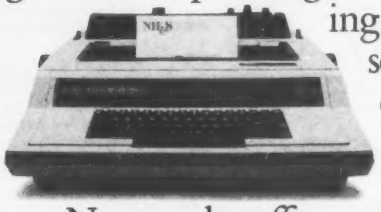

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Micronotes

Colorcorp has announced **Colorbiz,** an inventory software package for the IBM Personal Computer that offers color capabilities to the business user. Features include data base retrieval capability, bar charts, report generator, on-line directions, password security and error checking. It is available for $498 from the vendor at 208 N. Berkshire, Bloomfield Hills, Mich. 48013.

Applied Software Technology has introduced a version of its **Versaform** business forms processor for the Apple Computer, Inc. Apple III microcomputer. Common applications of the software include invoicing/accounts receivable, purchase order generation/operations management; professional time and billing; and estimating/job costing and personnel records/benefit accrual reporting. It is available for $495 from the vendor at 14125 Capri Drive, Los Gatos, Calif. 95030.

Technical Systems Consultants, Inc. has introduced the **6809 Ansii Fortran-77 compiler** for the Motorola, Inc. 6809 microprocessor. It is available on 5-in. or 8-in. diskettes and operates under the vendor's Unix-like operating systems, Flex and Uniflex. A single-CPU license for the compiler ranges from $375 to $450 from the vendor at 111 Providence Road, Chapel Hill, N.C. 27514.

Quantum Software Systems has introduced an operating system called **Qunix,** which is similar to Bell Laboratories' Unix operating system for use with the IBM Personal Computer or any microcomputer based on the Intel Corp. 8086, 8087, 8088 and the Motorola, Inc. 6809 microprocessors. The price for the operating system ranges from $150 to $300 and is available from the vendor at 7219 Shea Court, San Jose, Calif. 95139.

Onyx Systems, Inc. is offering a version of Bell Laboratories' Unix operating system called **Unix System III.** Its features include multikey indexed sequential file systems with file and record locking and enhanced printer handling capabilities. It costs $1,500 from 25 E. Trimble Road, San Jose, Calif. 95131.

Comsen, Inc. has announced three applications for the IBM Personal Computer as part of its Proaid series of programs. **Comdata,** a data base management application, costs $250. **Comorg,** a menu generator, costs $90 and **Comsort,** a file sorter, costs $80 from the firm at 20-A Erford Road, Lemoyne, Pa. 17043.

Le Roux International, Inc. has converted its centralized network modeling tool, **Opal II,** to run under Digital Research, Inc.'s CP/M operating system. Previously available only on the Apple Computer, Inc. Apple II, Opal II costs $499 from the firm at 3090 Acushnet Ave., New Bedford, Mass. 02745.

A text formatting program called **Footprint!,** said to be compatible with any text editor and computer for which a Pascal compiler is available, has been announced by Sterrett Consulting, Inc. The software costs less than $200 from the firm at 176 Broadway, New York, N.Y. 10038.

Release Version 1 of International Entry Systems, Inc.'s (IESI) Digital Research, Inc. CP/M operating system for IESI **Datacorder IV and V** microprocessors is available from the firm free with each model. A 58K-byte version of the operating system is said to offer maximum available memory, while the 50K-byte system maximizes disk access speed. Datacorder IV costs $5,000 and Datacorder V costs $5,500 from 408 N.E. 72nd St., Seattle, Wash. 98115.

Dollartrak VIII is a three-dimensional financial modeling program that operates under Digital Research, Inc.'s CP/M and MP/M operating systems. It features capabilities including financial evaluation, balance sheet, income statement, sales forecast, total expenses and marketing expenses. It is priced at $295 and is available from Software Automation at Suite 311, 25381G Alicia Pkwy., Laguna Hills, Calif. 92653.

A microcomputer version of the **Cogen Cobol program generator** has been announced by Bytek. The product runs on Digital Research, Inc's CP/M-based microcomputers and reportedly offers standard business applications including file maintenance, inquiries and reports. This version is available for under $1,000, the vendor said from 1714 Solano Ave., Berkeley, Calif. 94707.

The **Supersoft C Compiler** is now available for the IBM Personal Computer in both Digital Research, Inc.'s CP/M-86 and Microsoft, Inc.'s MSdos versions. This product is a three-pass compiler that uses syntactic analysis to produce U-code in the first pass, optimizes that code in the second pass and generates assembler code in the final pass. It sells for $500 for the CP/M-86 and IBM Personal Computer versions and $250 for the CP/M-80 version. It can be obtained from Supersoft Associates at P.O. Box 1628, Champaign, Ill. 61820.

Reformatter is the name of new conversion software released recently by Microtech Exports, Inc. It is said to convert Digital Equipment Corp. RT-11 files to Digital Research, Inc. CP/M formats. Users can also exchange files between PDP-11 and CP/M-based word processors, the vendor said. The utility is priced at $350 and is available from Microtech at Suite 2, 467 Hamilton Ave., Palo Alto, Calif. 94301.

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Capacity Planning and Communication

How the data center can get top management's attention — and use it wisely — to communicate the need for new computer capacity.

By Melvin J. Strauss

The most valuable commodity in any organization is the attention of senior management. With it, any problem can be solved; without it, no major decisions can be approved. But, as organizational texts will agree, that attention is a scarce resource.

As with any other scarce resource, management's attention should be used sparingly and effectively if it is to be available whenever decision approvals are required. Management should receive a minimal amount of information from the data center. The more numbers communicated, the greater the chance of misinterpretation or confusion. As a rule, no information need be offered unless it pertains directly to specific actions that are being sought.

Effective use of management attention implies that communications are concise and in a language with which the audience is comfortable. Put more bluntly, few outside the world of data processing enjoy speaking "computerese." If forced to use it, most non-DP managers will either misinterpret the data they receive, lose confidence in managers they perceive cannot communicate in the language they and their peers accept, or simply lose interest and not make any decision.

There are generally two classes of communications to management. One is some sort of monthly or other cyclic set of indexes that describes either production or budgetary data. (Since the presentation of budgetary data is generally understood, it is ignored for the pur-

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IN DEPTH

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INFORMATION SYSTEMS

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poses of this discussion.) Usually, there is little real purpose to these production indicators other than to let management know the data center is still in existence and that no disasters have recently occurred. The other class of communications is associated with impending changes or decision processes.

Data Presentation

It is important to recognize the difference between management's concerns and the concerns of the data center. Management abhors an absence of data, and rightly so. Without brief monthly indexes, it would be impossible for management to obtain quick glances of the business-as-usual state and of global progress in meeting key objectives. However, the data center itself gains little from providing these statistics.

But since the data center often cannot escape the burden of providing them, it ought to use the opportunity to encourage management to ask questions it wishes management to pose. In addition, the data center should encourage management to respond to certain types of indexes the data center will use when it asks for approval of capacity acquisition decisions. Once this sort of dialogue is established, dialogues during decision-making sessions will be much simpler and much more effective.

In selecting data to be presented, there are two options: to publish everything or to publish only key indicators. Since management's production concerns are usually units of output, plant utilization, service and unit production cost, those are the key indicators management should ordinarily receive and nothing else. Other data such as device utilization, average response time or number of jobs processed can be provided upon request (a rarity) or in response to specific problems that may arise.

Two-Tier Concept

Note how this approach follows a two-tier concept of separating capacity/demand issues from performance tuning issues. Capacity/demand issues are reserved for management, while tuning concerns are directed toward the technical staff. Each has access to the other's data when desired.

The key indicators are provided according to the data's availability. Units of output has no meaning in a multiuser, multiapplication environment since the output, processed data, is intangible and rarely homogeneous across the application base. For example, if one application produced one report and another processed 10,000 transactions, no direct comparison of the size or significance of the two outputs could be made. Hence, no statement regarding the total number of units of output can be made.

For the case of a facility dedicated to one user or application, a count of transactions processed or records updated might have some meaning. However, one must be careful to distinguish between results (output) from the data center and transactions arriving indirectly from other work areas. The former, if in a form conducive to measurement, might be representative of output. The latter is often broken down or grouped into intermediate transactions of different size and different computer resource requirements.

Counts of these items, again, if in a

form conducive to measurement, may have little meaning to the corporate front office in relation to the goods or services it perceives it is marketing. Hence, units of output is often an index that is impossible to formulate well. Besides, if computer processing is, in fact, supportive of the processing of some item for another node of the corporation, the item count will appear in that node's monthly index.

Plant utilization, in the context of this discussion, refers to the utilization of the data center. One choice of presenting data is to publish utilization statistics on your 10 favorite classes of equipment. Examples might include lines of print, billions of tape or disk I/Os performed, hours of elapsed or connect time, problem-state CPU seconds and so on. But this approach tends to be somewhat confusing and does not always relate directly to plant (capacity) utilization.

A second choice is to describe plant utilization consistent with the "critical resource concept." Briefly, this concept recognizes that while there are literally dozens of equipment and staff factors that comprise a data center, there is always one that is more constrained, in shorter supply and more expensive to increase than any other. That one resource in many ways typifies the relationship in the data center between demand and capacity. In the vast majority of cases, this resource is the CPU.

An example of describing data center utilization in this manner would be to report demand as, say, 80% of capacity. The audience is conditioned to think of the data center in simple, one-dimensional terms. While this does not describe the entire environment, it provides a picture of the most critical element and implies the state of the data center under normal business conditions.

Unusual conditions are either transient and not of a duration long enough to be significant or fall into one of two categories. One is the emergency of which management, if it has been alert, is already cognizant. The other is the case of persistent data center problems that tend to become known throughout the corporation regardless of the type of demand index published. Communications to management regarding the acquisition of less critical, small-segment units of capacity (tape drives and so on) are distinct from normal monthly data center status reporting and are handled separately, although in a similar format.

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
Relevant Capacity *	1.4	1.4	1.4	1.4	1.4	1.4	2.0	2.0	2.0	2.0		
Average Demand	68%	69%	71%	72%	70%	74%	51%	54%	53%	57%		
Peak Demand	81%	83%	85%	80%	85%	92%	66%	67%	68%	74%		
Efficiency Factor	96%	97%	96%	96%	97%	95%	99%	98%	97%	99%		
Service Indices:												
Data Center Controlled	97%	98%	97%	98%	98%	96%	97%	96%	98%	96%		
Overall	96%	95%	96%	97%	97%	95%	96%	95%	97%	94%		

*In terms of 2 IBM 3033 Central Processing Units

Charts Courtesy of Van Nostrand Reinhold

Figure 1. Table of Production Indexes

Figure 1 offers a tabular format that can be used to communicate production indexes. The first row states the capacity level that existed during the reported month. This is useful for comparing the states of different data centers and for interpreting relative movements of the statistic. (For example, if demand dropped by 33%, was a third system added that month?) The service statistic is merely the accumulation of performance against service criteria specified for each application or user the data center supports.

As stated previously, unit production cost is a third statistic that typically draws management's attention. However, since good accounting procedures suggest that capacity chargeout rates should be made static across the fiscal period or budget cycle, there is little meaning to a monthly unit cost statistic. If budgetary variances are treated separately as budget (rather than production cost) items, then the only factors that could be reflected in a varying unit cost statistic are variances due to changing average demand (since monthly average unit cost would vary inversely to average demand) and variances due to efficiency (the utility and, therefore, the unit cost of capacity vary inversely to the amount of capacity available for productive purposes).

A cost statistic, then, offers no information beyond the statistics of average demand and monthly efficiency and is clearly excessive and superfluous data. And offering superfluous data obviously is to be avoided if management's attention is to be preserved for future needs. Hence, no cost statistic is included in Figure 1.

Graphing Trends

Sometimes tables of statistics are not effective for dealing with certain management styles and pictures are more appropriate. Figure 2 offers a method of graphing demand trends. The solid line represents actual demand and the dashed line represents the current forecast. In order to keep the chart simple, only three items are shown relative to "relevant capacity": peak demand, average demand and the service risk level, that is, the

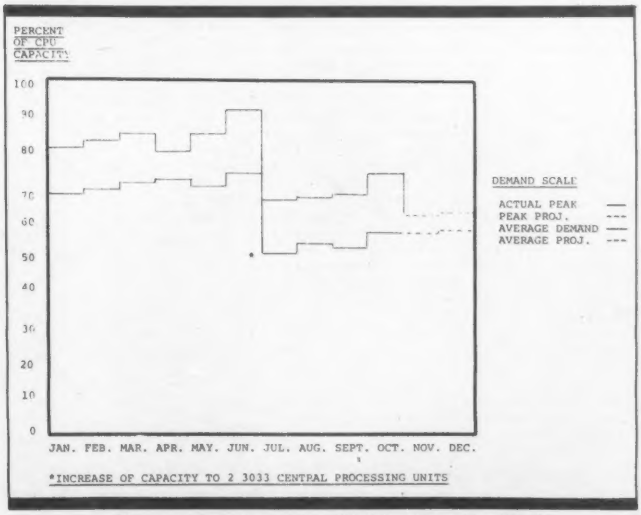
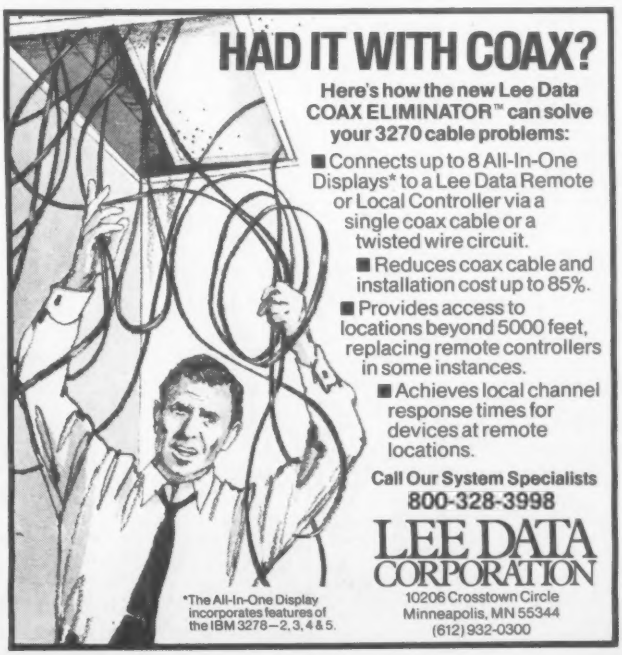


Figure 2. Data Processing Division Capacity Chart



IN DEPTH

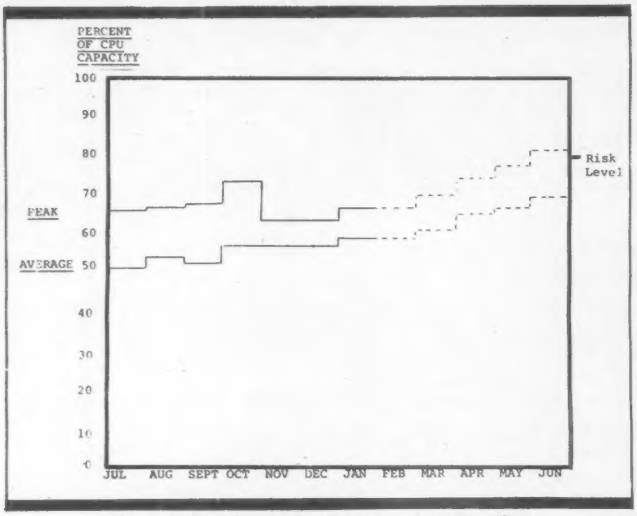


Figure 3. Data Processing Division Capacity Chart

'Since management would rather not deal with either degraded service or commitments of funds, it is important to continue to limit the flow of data to as little as the audience wishes to see. The presentation can often be structured by layering the data and sensing when the audience will accept no more.'

level of system utilization beyond which response time and other service indicators become unacceptable.

These items are expressed in a manner that is consistent with the critical resource concept, again for purposes of simplicity. Often an accompanying paragraph or two explaining the major reasons for change from last month to the current month adds credibility by giving the perception of control and of knowledge of the data. This generally involves establishing feedback to report on the permanence of changes in demand, fully disclosing the data center's (site's) contribution to the demand problem and challenging the validity of your own statistics (efficiency) when they exceed accepted tolerance limits.

Suppose, for the sake of example, Figure 2 evolved to Figure 3 several months later. Demand varies significantly from earlier projections and the current projection has demand penetrating the risk level in several months. Now is the time for gaining management's attention by warning that a decision must be made either to permit degrading the servicing of computer demand or to allocate funds for a major capacity acquisition.

The communications required to effect decisions are merely an extension of those for communicating the business-as-usual state.

Since management would rather not deal with either degraded service or commitments of funds, it is important to continue to limit the flow of data to as little as the audience wishes to see. Presentations relating to finances and service are usually more effective in the form of meetings rather than merely reports, and the presentation can often be structured by layering the data and sensing when the audience will accept no more. Further, to keep the audience's attention, it is important to make the entire presentation in the language with which it is most comfortable. This implies avoiding all use of technical jargon.

The data prepared to facilitate the decision should anticipate three questions:

- What happened?
- What is the best solution?
- How much will it cost?

The first question is the most critical since it opens the presentation, states the issue management is being asked to address and provides reference data to help management understand the business and organizational factors that led to the need for a decision.

Figure 3 is a good starting point since it succinctly states the issue: The corporation will run short of computer capacity during month X. But this diagram presents only peak and average demand. A slightly more detailed chart such as Figure 4 is required to describe a typical 24-hour operating cycle for the data center. The first column indicates the time of day, here expressed in one-hour intervals, and the second column provides the raw usage statistic, here expressed in CPU minutes. (Note that this example concerns a request to augment the critical resource, the CPU. Presentations to increase other resources such as I/O equipment would follow the same format.)

The third column converts the second column into a percentage of relevant capacity. It may be observed the site has a relevant capacity of 12; that is, (391.42 min ÷ .5436) ÷ 60 min/hour. The histogram to the right converts the third column into graphical format and provides an easy-to-read picture of the capacity/

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WORK OF FEBRUARY 1980

GRAPH OF AVERAGE CPU USED FOR ALL JOBS BY ALL USERS

INTERVAL	AMOUNT	PERCENT
0800-0900	391.42	54.36%
0900-1000	422.50	58.68%
1000-1100	475.47	66.06%
1100-1200	551.85	76.65%
1200-1300	504.94	70.13%
1300-1400	512.92	71.24%
1400-1500	525.68	73.01%
1500-1600	541.51	75.21%
1600-1700	542.10	75.29%
1700-1800	531.47	73.82%
1800-1900	547.83	76.09%
1900-2000	475.76	66.08%
2000-2100	469.78	65.25%
2100-2200	453.27	62.95%
2200-2300	392.02	54.45%
2300-0000	399.65	55.51%
0000-0100	307.21	42.67%
0100-0200	317.07	44.04%
0200-0300	352.28	48.93%
0300-0400	406.61	56.47%
0400-0500	387.45	53.81%
0500-0600	410.17	56.97%
0600-0700	432.25	60.04%
0700-0800	401.04	55.70%
AVERAGES	448.01	62.22%

Figure 4

demand state. With the risk level assumed at 80%, the equipment complex is nearly saturated.

The value of a 24-hour chart like Figure 4 is that it forces questions regarding which applications constitute the peak and, therefore, take joint responsibility for the need to augment capacity. Attention is then focused on the management of this subset of demand to determine whether the business requirements of some are such that their processing can either be deferred to periods of lighter production (2200 to 0300 in the example) or can be reduced absolutely.

With the issue stated that capacity will soon be in short supply, an explanation is required that either states that the targeted saturation date is as previously forecast (that is, the request for new capacity should come as no surprise to the corporation) or that there has been a variance to the previous forecast.

Figure 5 hypothesizes a case where there in fact has been a variance. The solid line represents the trend of actual demand over, say, the last three years. The lower dotted line represents the demand prediction the data center manager presented to his management last year. Based on the slope of all but the last few months, his forecast merely extends the previous growth rate into the future. However, the temporary surge of those last few months turned out to be indicative of continued future growth, as described by the upper dotted line. Thus, the data center manager explains, he is back before management to seek capacity relief many months ahead of his earlier expectations.

Strengthening the Message

The foregoing is sufficient to state the issue and describe what has changed. The uncertainty the data center manager faces as he seeks a capacity acquisition decision relates to the extent to which his superiors will believe the data he has presented and to the user community's perception of how much computer capacity they use and the rate at which their usage is growing.

To strengthen the presentation, the data presented in Figures 4 and 5 should, whenever possible, be derived from the computer's own job accounting system, and the actual formatted output, if at all feasible, should be computer-generated. While managers may challenge other managers, they often are reluctant to attack a faceless computer, its manufacturer and what they perceive to be a massive data base. The result is that data prepared by hand and printed by computer can have more credibility than computer-generated data that has been manually typed.

In addition, the ability to return rapidly with reordered or supplemental data helps foster the perception that the capacity acquisition decision is based on a foundation of broad and well-ordered data.

Reinforcing the data provided by Figure 5, Figure 6 illustrates a computer-generated quarterly growth trend for one user serviced by the data center. The purpose of this chart

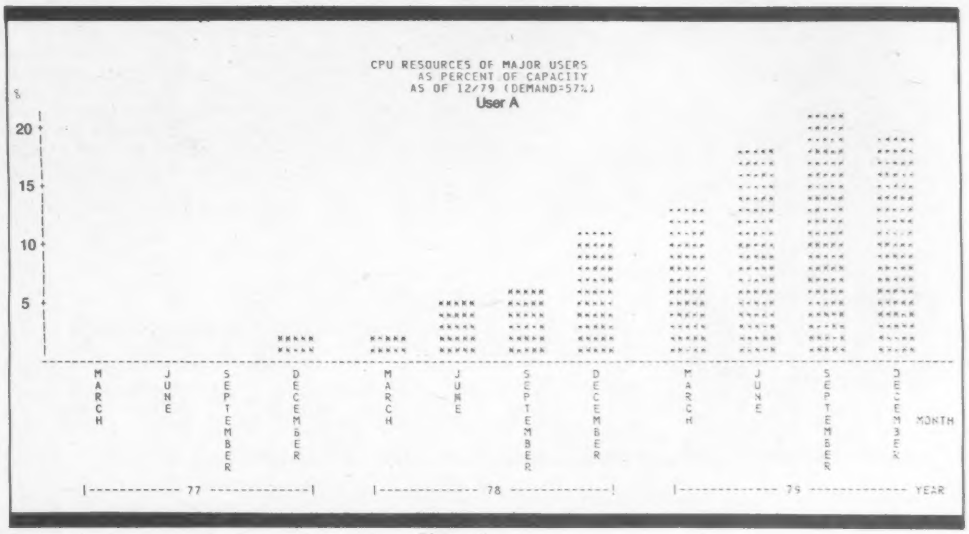

Figure 6

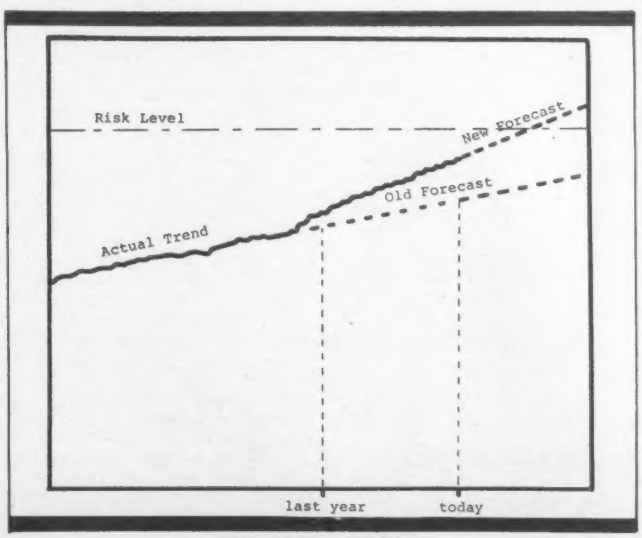

Figure 5. Demand Trend

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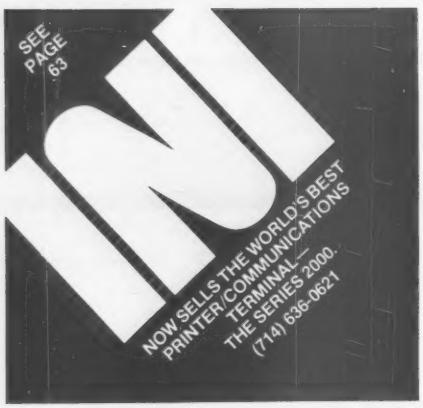

is to isolate the business sector or sectors responsible for the variance of the earlier forecast or to provide supplemental data if it appears there is a credibility issue or resistance to the request for new capacity.

If the discussion goes further, it is likely to occur at a lower organizational level where users will be told to verify that the data presented is accurate. In such cases, application-level data similar in format to Figure 4 is useful for providing a record of resource consumption across the 24-hour daily operating cycle at the application or job level.

The purpose of these charts is not to convey resource usage statistics directly to senior management, but rather to make management aware that the data center's information base is extraordinarily detailed and is based on a third party's (usually the equipment vendor's) unbiased job accounting system. A further purpose is to quickly convince any user to support the resource usage conclusions at which the data center has arrived. Timely and succinct presentation of data is as valuable for ensuring credibility as it is for ensuring the ability to formulate computer capacity decisions.

The foregoing is sufficient to support the need for capacity acquisitions under a variety of organizational environments. Related issues of optimizing among alternative capacity acquisitions and of determining costs can be addressed with a variety of techniques. Because these issues themselves would involve lengthy discussions, they are not addressed here.

In Summary

Implementing a capacity decision, then, is as much a function of the ability to communicate issues to senior management as it is a function of correct technical problem solving. Decision data that is communicated to senior, nontechnical managers is best received when it is presented in nontechnical language and in small, concise packages.

Whether the data is in tabular or graphical format, the terminology used should be matched with that the senior manager receives from other parts of the corporation — usually demand as a percent of capacity, units of output (if applicable) and efficiency. If appropriate, unit cost data can be added.

While the reporting of monthly business-as-usual statistics is limited to small numbers of key indexes, information packages supporting decision approval requests are usually larger and layered to anticipate various degrees of management concern.

About the Author

Melvin J. Strauss is vice-president of the Chase Manhattan Bank, N.A., and has been responsible for its Computer Production Planning and Control Division. He joined the bank in 1970.

He began his career at General Electric Co., where he developed and programmed scheduling algorithms. He has worked in the areas of capacity planning, work-load forecasting, performance measurement, computer modeling and computer charge-out.

Strauss is a frequent speaker and author of several articles on industrial engineering as it relates to data processing. He received a bachelor's degree from Hofstra University and a master's in engineering science from Pennsylvania State University.‡

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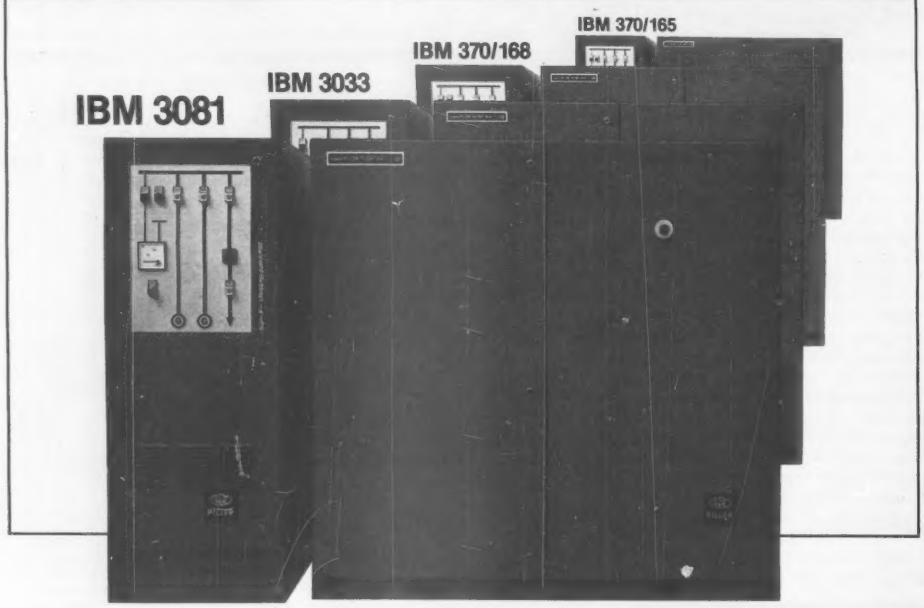

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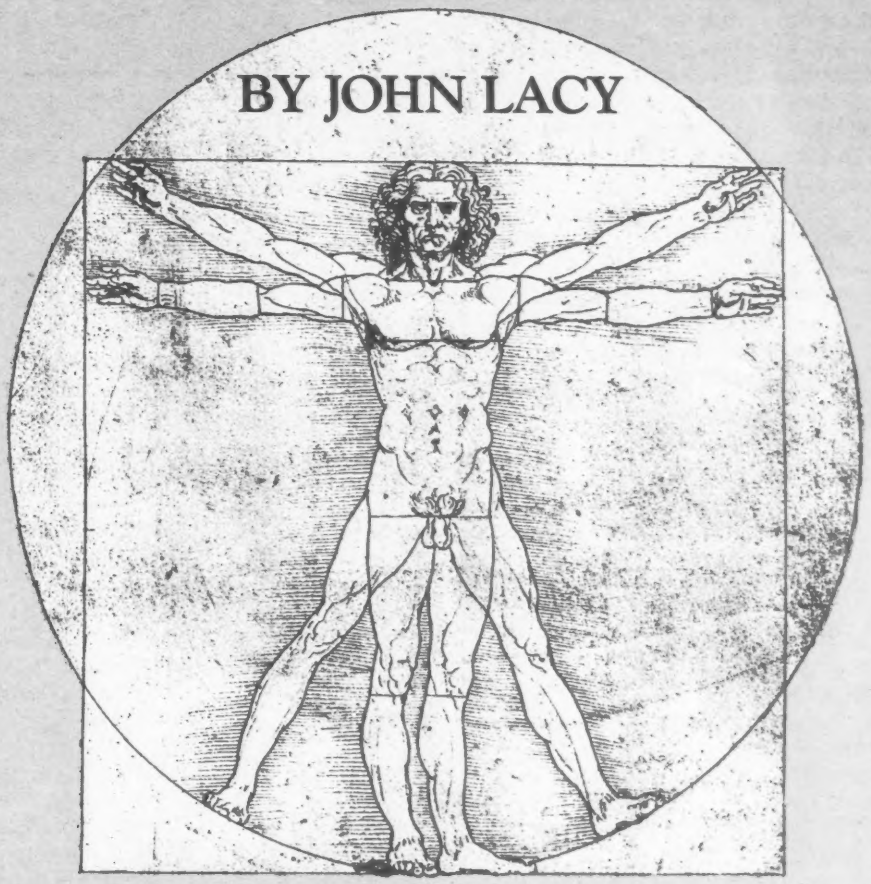
THE RENAISSANCE IN MICROGRAPHICS

BY JOHN LACY



Micrographics has blossomed into a state-of-the-art tool in office automation.

FIVE OR SIX YEARS AGO, MANY MICROGRAPHICS "EXPERTS" PREdicted that microfilm would soon be out of date. They were proven wrong. Today the industry is experiencing an annual growth rate of 10% in real terms. This turnaround came about because, quite simply, other forecasts concerning office automation (OA) and information handling also were incorrect.

For example, a few years ago it was predicted that technology would create a decline in office paper use. Correspondingly, a decline in microfilm volume was predicted.

This didn't happen. Electronic funds transfer failed to take hold as predicted, so the volume of financial paper continued to expand. On-line access to computers in office environments grew as predicted, but not at the expense of paper. In fact, even though more information became available to more workers via the computer, paper use still increased.

Information will continue to originate on paper, but only part of that data will go into computer and DP systems. The rest will remain on the originating document itself, which can be captured on microfilm and stored in a microimage file. There it can be retrieved quickly whenever necessary to provide access to the additional information not stored in

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World-Class Networking Today

Honeywell's DSA establishes standards for data movement and application cooperation in compliance with the International Standards Organization's (ISO) open systems reference model. The architecture, which is not dependent on specific technology or techniques, keeps applications and communication processes separate. Thus DSA is transparent to the end user. DSA creates a cooperative, flexible environment within which the user can build and phase in a communications system that can handle current applications and grow to meet new domestic and international demands.

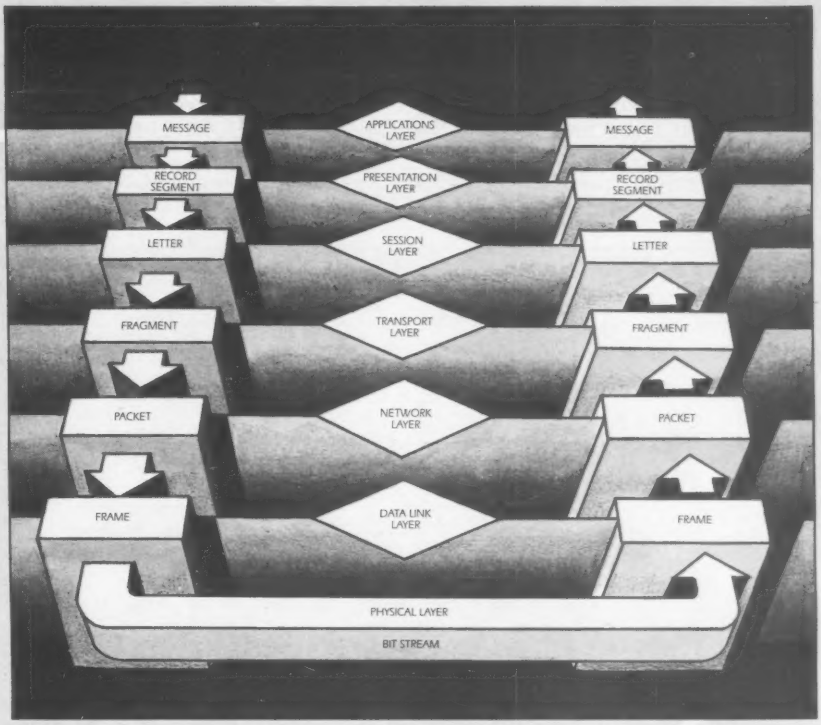
DSA Structure

DSA's flexible set of rules, protocols, and interfaces allows users to configure and implement data processing systems and networks to help meet the needs of geographically dispersed organizations. Introduced in 1980, DSA consists of a seven layer architecture divided into three groups. The implementation of the first four layers in the Communications Management group controls physical exchanges across the network. The next two layers, the Message Management group, format messages so that the communicating entities can understand each other. They also contain the dialog mechanism that permits communicating activities to synchronize their actions, and the presentation control services which provide application independence from data format, character codes, and terminal handling conventions. The seventh layer, Applications, defines the logical rules to which computer applications conform when communicating. Finally, each layer of DSA also provides network administration and control data to enable overall network control of the distributed system.

Network Support

Because DSA conforms to the ISO open systems model, it's certified as providing native support for the CCITT international X.25 packet-switched and X.21 circuit-switched network protocols. These protocols are being implemented in a growing list of public data networks around the world as well as in value-added and private networks. DSA products support such X.25 based networks as TELENET and TYMNET (United States), DATAPAC (Canada), DATEX-P (Germany, Austria), DDX-P (Japan), DN 1 (The Netherlands), EURONET (European Economic Community), PSS (United Kingdom), EDWP (Switzerland), and TRANSPAC (France). Also supported is the X.21-based NORDIC Net (Scandinavia, Finland). DSA uses High-level Data Link Control (HDLC), also an ISO standard, for data communications between intelligent devices in private networks. Users can configure hierarchical, peer-coupled and hybrid network topologies.

Product Implementation
DSA already enables medium-scale and large-scale host computers and mini-computers to operate in a variety of network configurations. Specialized network processors can be utilized for front-end processing, remote concentration and switching, in addition to communications control and administrative functions. The implementation includes such distributed processing applications as file transfer, remote job entry, terminal concentration and two-level transaction processing as well as office automation applications, including document distribution and host storage, and printing of documents. In addition, DSA administration permits monitoring, control, and maintenance of the network from one or more control sites.



DSA consists of seven layers of functions and protocols governing data handling among network nodes. DSA's implementation of the bottom four layers makes physical exchanges across the network transparent to the end user.

Future Growth
DSA is an important part of Honeywell's implementation of its Distributed Systems Environment (DSE). Future DSA developments will support fully-distributed transaction processing with system-supplied coordination, control, and recovery, load leveling, and resource sharing across computers. This type of peer network will allow host and satellite processors to cooperate as full equals in distributed systems. The open architecture will be further enhanced to meet evolving international network standards while protecting investments in systems already installed. Additionally, data bases will be partitioned across multiple processors with automatic access and updates at all locations. Thus DSA is part of an evolution to fully distributed systems with globally accessible resources.

More on Distributed Processing Networks
For an in-depth description of the DSA open architecture call our toll free number, 800-343-6294 (in Massachusetts call 617-552-2264) or write Honeywell, 200 Smith Street (MS 487), Waltham, Massachusetts 02154.

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IN DEPTH

the computer.

The retrieval capability of microfilmed documents was made possible largely by the computer itself. The linking of the computer with micrographics has brought about the concept of computer-assisted retrieval of information stored on microfilm.

This leads us to the state-of-the-art use of micrographics in the office: electronic filing.

Electronic filing enables users to capture the images of incoming documents on coded 16mm microfilm, store those images in a microimage file linked to a computer and then retrieve documents as needed. This system offers users the traditional advantages of microfilm, such as space savings, archival storage quality and file integrity.

In addition, it uses the speed of the computer to search through files for a specific document and the memory of the computer to store the location of every filed item, thus eliminating "lost" or misfiled documents. Users can even dispense with paper records if they wish and work solely from the microfilm images.

Electronic filing is a flexible concept that can be merged into most existing job streams and is suitable for both high-volume and low-volume applications. Active records such as sales orders, invoices, correspondence, insurance claims, checks, purchase orders and freight bills are among those suitable for electronic filing.

As these documents enter the job stream, certain data is routinely extracted and keyed into the computer system. For electronic filing, each document should be assigned an address or location within the microimage file and that information, too, should be entered into the system. The documents themselves are then microfilmed and the processed film stored on 16mm magazines. As this happens, the microfilm device exposes an image mark or "blip" under each document image on the film. This image mark corresponds to the address of the image within the microimage files.

For high-volume applications, high-speed rotary microfilmers can microfilm and encode automatically up to 10,000 letter-size documents per hour. The needs of low-volume job streams of perhaps less than 1,000 documents a day can be served by less costly planetary microfilmers, still providing the necessary encoding capability. These addresses and corresponding image marks become the key to retrieving specific document images.

In Operation

At a typical electronic filing retrieval station, an operator uses a computer terminal, a microfilm magazine access file and a microimage terminal. When specific information is requested, the operator calls up the relevant data via the terminal. The information displayed will answer many inquiries without a need to proceed further. If this data is insufficient to handle the inquiry, the operator then reads the original document's microimage address on the CRT display, selects the appropriate 16mm

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MICROGRAPHICS IN DEPTH

microfilm magazine from the access file and inserts it into an intelligent retrieval terminal. Under computer control, the microimage terminal automatically searches the microfilm at speeds up to 600 letter-size images per second until it reaches the precise image, which it displays on a viewing screen.

The entire operation takes only seconds to accomplish. In addition, if a paper copy of the document is needed, one can be produced at the touch of a button.

The flexibility of electronic filing permits its introduction into almost any job stream. Three typical configurations — mainframe, remote and stand-alone — will meet almost any need.

In the mainframe approach, the current data base, resident in the host computer system, is used to provide the index to the microfilm files. Data entry remains the same, except that the operator now adds the microfilm address of each document image to create the necessary index.

The second common configuration, remote, uses a remote minicomputer to enable an organization to take advantage of the data entry already done with the mainframe computer. Selected information, such as the microfilm address and key descriptors, is downloaded from the mainframe to the minicomputer via direct batch transmission or magnetic tape. This eliminates the labor associated with creating a microfilm index for the minicomputer. When a document is needed, the microimage retrieval terminal is linked to the minicomputer to find the appropriate document image.

The third typical configuration employs a stand-alone minicomputer that is used to store the microfilm index and to control the retrieval of a specific document image. Here the index is created and maintained on the minicomputer.

Users have a range of appropriate software packages and interface modules available to link different vendors' micrographics hardware to various makes of computer equipment. Even the image-capture process is designed to fit into commonly accepted formats. For example, some microfilmers offer indexing capabilities that permit users to expose three different-size image marks below microfilmed document images. This multilevel technique lets users organize document images and information in block, batch and item categories, making microfilm indexing compatible with DP indexing techniques.

Without Computer Hookup

Electronic filing is an example of the most sophisticated use today of micrographics

SEE PAGE 63

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IN DEPTH

in the office for nonarchival purposes. But users can also employ micrographics to achieve automated retrieval without linking their micrographics hardware to their computer system. This approach, too, enables micrographics to handle active records, not just archival storage, and still offers users space savings, quick access to information and efficiency improvements.

One approach to achieving automated retrieval of microfilm images without utilizing a computer is to employ a less sophisticated microfilmer and a microimage retrieval device that utilizes a binary code, similar to the Universal Product Code found on supermarket packages. As documents enter the job stream, they are microfilmed in rough batches. The operator assigns each document an alphanumeric code (up to eight digits) and the machine automatically represents that code as a binary bar code below the corresponding document image on the microfilm.

To retrieve a document, the operator inserts a 16mm microfilm magazine into the retrieval device, keys in the appropriate location code and presses the search button. The machine automatically scans bar codes on the microfilm — at the rate of 280 images per second — until the requested document image is located. Again, a paper copy can be produced if needed.

Automated retrieval and electronic filing offer distinct advantages in the office work place in terms of managing and retrieving information. Both commonly rely on 16mm microfilm. Since a typical microfilm magazine can hold up to 25,000 8½- by 11-in. documents, approximately nine million documents can be within arm's reach in a microimage access file, which holds up to 360 16mm magazines.

Microfiche Format

Microfiche is another common format of microfilm. Typically, it is a "card" of film, approximately 4 in. by 6 in., containing a number of images. Much of the microfiche used in the office contains computer-generated data from a computer output microfilmer (COM) device. It normally is not used to store and retrieve source document images. Instead, it is used as a medium on which computer data is printed, distributed to users and then, perhaps, stored.

In an office, fiche can be used instead of paper for computer reports. A DP operation prints reports on microfiche, duplicates the number of copies needed and distributes the reports to users throughout the office.

These individuals turn to small, inexpensive fiche readers to study the reports. This offers cost advantages because it is cheaper to print computer reports on fiche than on paper. For example, a 1,000-page, three-part report on an impact printer costs about $30. The same report on microfiche costs about $1.

Today's generation of COM devices prints with a laser on dry, heat-processed film. The photographic chemistry associated with COM systems of the past is no longer need-

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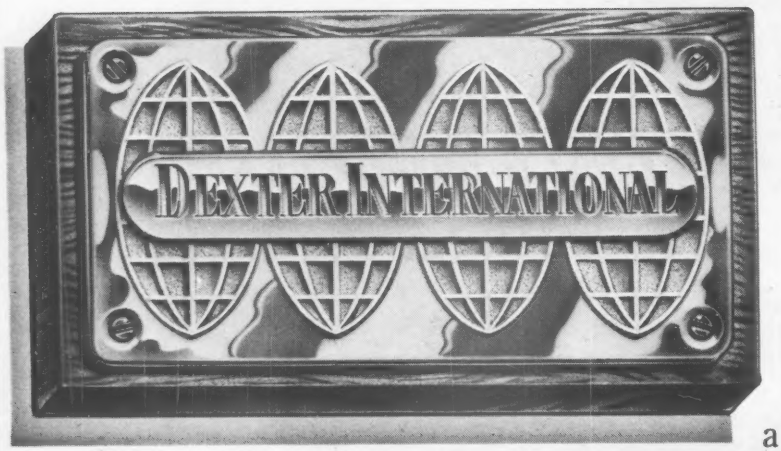

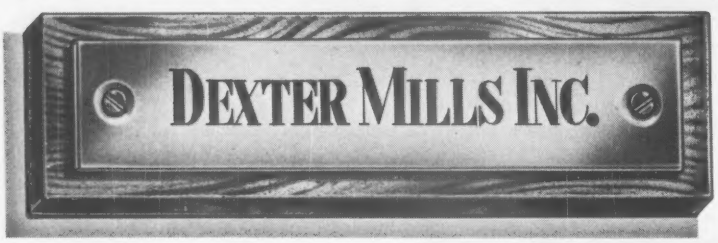

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WARDLY OMPUTER.

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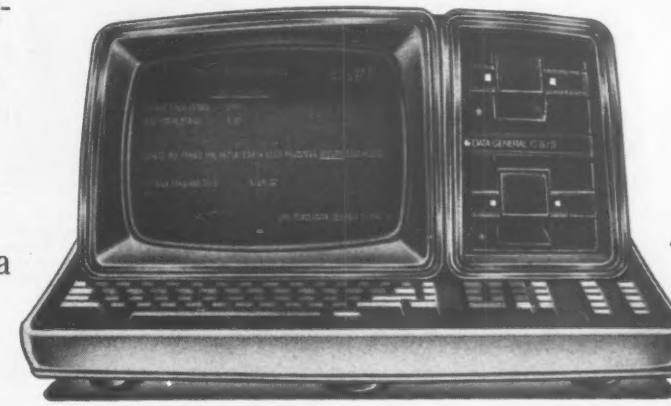
*On the CS/5 only BusiTEXT is currently available.



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WE ENGINEERED THE ANXIETY OUT OF COMPUTERS.

ed, which makes COM hardware easy to install in a DP environment. In fact, a COM device functions simply as any other high-speed printer in a computer operation. They can operate at the rate of 10,000 pages per hour and require little or no operator intervention. Because of this speed and economy, many computer operations use COM to run Sysout reports and other such voluminous jobs.

Office workers readily accept the advanced micrographics devices employed in both computer-assisted retrieval and COM systems. A few years ago, there was some resistance to using a machine to "look up" records or information, perhaps because of the static nature of traditional microfilm methods. But today, people are accustomed to turning to a terminal for answers and information.

Micrographics devices — fiche readers and retrieval terminals — are merely additional elements in the growing array of electronic hardware that office workers use in the course of their jobs.

As office automation advances, so will micrographics. The technology has not reached its final plateau.

Eastman Kodak Co. has experimentally explored an advanced electronic filing system that links word, data and image processing. While the company does not contemplate bringing such a system to market, it has developed the system to test and confirm the contention that micrographics is a practical medium for the future, not just for the present.

The Microfilm Information Storage and Retrieval (Misar) system utilizes existing hardware to permit computer, word processing and micrographics equipment to work together. The software behind the system is the key element, telling each component what to do and linking all together.

Misar automatically captures incoming correspondence on microfilm. Via electronic filing, each document is available to the recipient whenever needed. Each recipient creates his own electronic filing index for retrieval purposes.

In the future, users will develop and employ advanced systems along lines that have been built on the electronic filing concepts of today.

About the Author

John A. Lacy is national sales manager, micrographics-information technology, for Eastman Kodak Co.'s Business Systems Markets Division, where he directs the sales and marketing organizations for business equipment products.

Lacy's career spans 25 years in the business and information industry. He is a member of the National Micrographics Association.

Lacy is a graduate of Bucknell University.

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Including X.25 Interface, Digital Gateway

Rolm Unveils Enhancements for CBX PBX

SANTA CLARA, Calif. — Rolm Corp. has unveiled an X.25 interface, a T1/D3 digital gateway, 56K bit/sec synchronous transmission, an automatic facilities test system for private networks and user remote polling of call detail data over telephone lines.

The X.25 interface was introduced for use with Rolm's Model CBX private branch exchange (PBX). It extends the vendor's integrated data communications capabilities into public packet-switched data networks such as Tymnet, Inc.'s Tymnet, GTE Telenet Communications' Telenet and the Net/1 network announced by American Bell, Inc.

DNI Complies With X.25

The Data Network Interface (DNI) consists of a set of printed circuit boards that mount in the CBX and provide four X.25 synchronous serial ports having RS-449 37-pin connectors. It complies with X.25 and associated companion recommendations X.3, X.28 and X.29.

The X.25 ports include one high-speed port for operation at speeds up to 56K bit/sec and three medium-speed ports for speeds to 9,600 bit/sec. A passive adapter can be used to support the RS-232C standard.

The DNI also allows asynchronous terminals to access X.25 networks through the use of a CBX-resident packet assembler/disassembler. Up to 63 asynchronous terminals may be supported.

The capability will be available during the second half of 1983. Support for 15 ports will cost approximately $8,000.

The T1/D3 gateway runs from a CBX to digital transmission facilities such as satellites, microwave, infrared and fiber optics and allows users to utilize shared voice and data communications.

Using the D3 data format, the interface combines 24 digital communications paths for voice and data into a single 1.544M bit/sec (T1) data stream. Up to two communications paths can be used for synchronous data transmission at a rate of 56K bit/sec or asynchronous data transmission at a rate of 9,600 bit/sec.

The interface will be available during the second quarter of next year and is expected to cost approximately $13,000.

The synchronous 56K bit/sec data switching feature for CBXs is achieved through a data terminal interface device that connects switched synchronous terminals and computers to the CBX at distances up to one mile. It will be available late next year and is expected to cost $1,000.

The CBX Automatic Facilities Test System (Afacts) is a hardware/software package that executes a series of tests used to monitor trunk performance. It can be used in several basic network configurations. Afacts will be available during the first half of next year and will cost approximately $9,000.

The remote polling capability for CBXs allows users to poll each system over standard telephone lines for call detail recording (CDR) data. CDR information includes the starting time of each call, number called and extension, trunk number, date and more. The capability will be available at the end of this year and is expected to cost between $14,000 and $17,000.

Rolm is located at 4900 Old Ironsides Drive, Santa Clara, Calif. 95050.

U.S. Bank Removes Lockbox Delivery Delays

By Jim Bartimo
CW Staff

PITTSBURGH, Pa. — The Mellon Bank is providing same-day payment information to businesses with Canadian customers by putting two Canadian banks on-line to the main office with Bell system dial-up lines.

Using its Canadian Lockbox Transmission service, the bank has reportedly speeded the accounts receivable systems of many area businesses, including the Aluminum Co. of America.

Before the bank offered this service, businesses with Canadian customers received payments through individual post office boxes called lockboxes. Canadian banks would collect the payments, process them and mail them to the bank here. Delays resulted from the slower mail service from Canada, and U.S. businesses would receive the payment information three days later, according to Mellon Bank Vice-President Peter Panos.

The Toronto banks now key in the payment information taken from the lockboxes and transmit it the same day to Mellon. "We take transactions from two Canadian banks and we have plans to add two more," Panos said. "We act as the intermediary between the Canadian banks and the U.S. companies. By providing same-day service, we're allowing those businesses to update their financial records daily.

"On a daily basis, 100 to 3,000 transactions may be processed from any one company," Panos said.

4,500 Transactions per Day

Some 4,500 transactions per day are edited and consolidated by Mellon after receiving the payment information over dial-up lines at 4,800 bit/sec. The two Toronto banks transmit the information from five cities between 4 p.m. and 7 p.m. The Mellon Bank transmits the edited, consolidated data to its customers at 7 p.m., providing same-day turnaround, according to Tom Huddleston, assistant operations officer for Mellon.

The Mellon Bank uses two IBM 3081s, two IBM 3033s and an IBM 370/168 in its own data center to process the payment information. Payment data is received from Canada and sent to U.S. businesses automatically over telephone lines through the use of automatic dialers and automatic pickup, Huddleston said.

The communications software, Datamover, was developed by Mellon Bank. "We've been providing lockbox service for companies in the U.S. since 1978. We receive transmissions from 55 U.S. banks," said product manager Patricia Farwig, "but transmissions from Canada were received for the first time last month."

"It took a while to get the system up," according to lockbox user Chuck Kahle, systems analyst for Wheelabrator-Frye Chemicals and Coding Group. "We started talking to Mellon Bank in April and it wasn't live until July. But it's very reliable now."

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Mux Lets LSI-11 Users Link With 128 Peripherals

TORRANCE, Calif. — Carat Computer Corp. has introduced a multiplexer that is said to allow users of the Digital Equipment Corp. LSI-11 microcomputer to interface with 128 local peripherals or remote devices and to reduce computer I/O processing overhead.

The Mighty Mux Model 500 multiplexer utilizes direct memory access rather than programmed I/O. Each port provides four status and control lines to ease the interface process and each can be programmed for synchronous or asynchronous communications, a vendor spokesman said.

In addition, separate I/O bit/sec rates, parity modes, character lengths, buffer sizes and other key parameters are said to be under program control on a port-by-port basis.

The unit is available for $1,848 from Carat Computer, 20775 South Western Ave., Torrance, Calif. 90501.

Asynch Mux Runs 16 Units

CHERRY HILL, N.J. — Infotron Systems Corp. has introduced an asynchronous polling system said to reduce data communications costs by permitting up to 16 terminals in different remote locations to share a single telephone circuit. It operates with dumb asynchronous terminals, front-end or host computer software.

The Supermux 580 was designed for inventory control, order entry, data collection and credit authorization applications. By replacing individual point-to-point telephone lines, the system cuts costs and provides other performance advantages, a vendor spokesman said.

An eight-channel master unit with two channels installed is priced at $1,850; a 16-channel unit with two channels installed is priced at $2,360. Each increment of two additional channels adds $300 to the price, the vendor said.

More information is available from Infotron Systems, Cherry Hill Industrial Center, Cherry Hill, N.J. 08003.

Graphics Kit Out for VT100s

MOUNTAIN VIEW, Calif. — Data-Type, Inc. has introduced a graphics conversion kit for the Digital Equipment Corp. VT100 CRT terminal. It is said to provide complete graphics operating features such as pan, zoom and scroll.

The DT100 kit emulates the command structure of the Tektronix Corp. 4010, 4014 and 4016 terminals, making the system compatible with various Tektronix Plot 10 software packages, according to a spokesman for the vendor.

The kit is available for $1,295 or $2,995 installed from Data-Type, 2615 Miller Ave., Mountain View, Calif. 94040.

Aids Direct Communications

CRT Terminal Out for Net Use

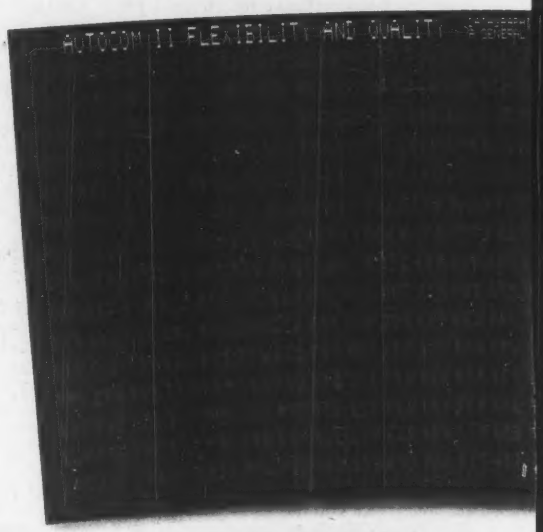
SAN JOSE, Calif. — ECS Microsystems, Inc. has introduced a CRT terminal said to feature fan-free operation; a nonreflective face plate; and a flicker-free, high-resolution, 80-char., 25-line display.

The 4650 system was designed for information networks and is said to permit direct communications between a terminal and one or more host mainframes.

Also featured are built-in dual floppy disk drives that provide up to 2M bytes of storage capacity in the terminal itself. The general-purpose interface bus provides up to 200K char./sec data transfer, the vendor reported.

The system reportedly offers full modem control, is compatible with a variety of printers and uses a standard RS-232C interface for synchronous and asynchronous communications at user-selectable rates from 300 to 19.2K bit/sec.

The 4650 terminal, with two 5¼-in. floppy drives and a 5M-byte, 5¼-in. rigid-disk subsystem, is available for $9,800 from ECS Microsystems, 215 Devcon Drive, San Jose, Calif. 95112.



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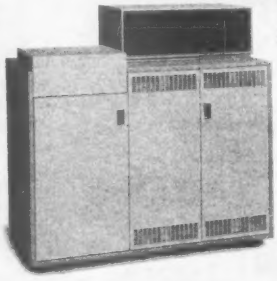

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In Asynchronous, Synchronous Modes

IDS Unveils Modem Eliminator

LINCOLN, R.I. — A modem eliminator said to cut costs by allowing the interconnection of data terminal equipment (DTE) without modems has been introduced by International Data Sciences, Inc. (IDS).

The Model 6110 Modem Eliminator reportedly can be used in either asynchronous or synchronous modes and with terminals configured for full- or half-duplex operation.

Features include four selectable RTS/CTS delays, internal strap selections for constant or controlled RTS, internal or external clock and nine clock rates ranging from 1,200 to 19,200 bit/sec. The DTE interface reportedly conforms to RS-232C and V.24 specifications.

DTE can be located up to 50 feet from the 6110, allowing a maximum separation of 100 feet between terminals, the vendor said. Terminal separation up to 500 feet is possible using the IDS Model 8520 Long Distance Cable.

The Model 6110 costs $370; delivery is in 60 days. More information is available from the Marketing Department, IDS, 7 Wellington Road, Lincoln, R.I. 02865.

Rixon Stat Mux Debuts With 9,600 Bit/Sec Module

SILVER SPRING, Md. — Rixon, Inc. has unveiled a four- or eight-channel statistical multiplexer with an integral 9,600 bit/sec communications interface module that reportedly eliminates the need for a separate modem.

The Commux provides error-free transmission for asynchronous data channels over a single synchronous composite link, the vendor claimed. It provides an unrestricted intermix of speeds from 50 to 9,600 bit/sec and any 5-, 7- or 8-bit Baudot, Ascii or IBM code.

With a maximum aggregate input of 19.2K bit/sec, speeds and codes are switch selectable on a per channel basis or automatic bit/sec rate can be selected.

A single-digit readout provides a continuous monitor of the composite link utilization.

The four-channel configuration unit consists of a single printed circuit card with a "piggyback" 9,600 bit/sec communications interface module. That module is V.29 compatible. It may also be operated at 4,800 bit/sec in the V.27 mode. It costs $3,990.

The four-channel version is upgradable to the eight-channel unit with the addition of a single extension card. It costs $4,690 from Rixon at 2120 Industrial Pkwy., Silver Spring, Md. 20904.

MDC Offers Editing Unit

TEANECK, N.J. — A text editing terminal has been introduced by Microsystems Development Corp., Inc.

The MDC 350 Text Handler is Intel Corp. 8085A microprocessor-controlled, has 48K bytes of memory, a 5¼-in. minifloppy disk, RS-232C communications interface, 8-bit parallel printer interface and paper tape interface.

The 12-in. CRT display monitor features a 7 by 9 dot matrix on a 9 by 12 block and a 1,920-char. display per screen.

With a single disk drive, the unit costs $4,950 from the vendor at 1560 Teaneck Road, Teaneck, N.J. 07666.

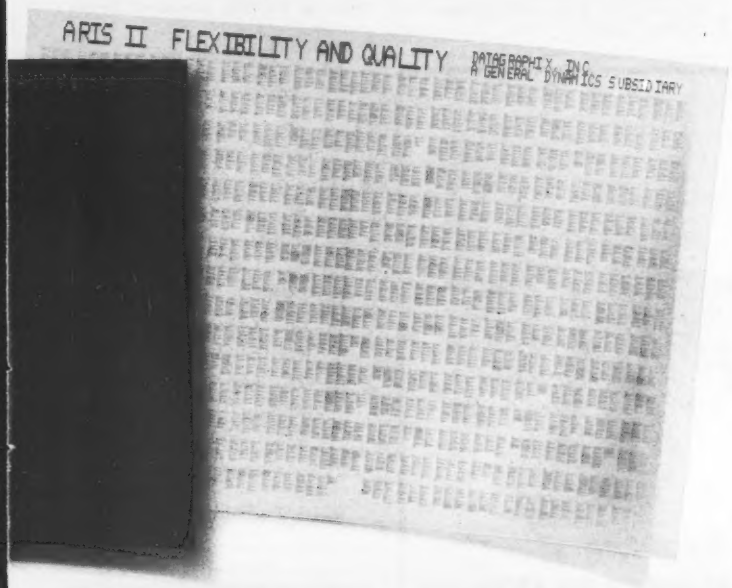
Modems, Muxes Get Price Cuts

SUNNYVALE, Calif. — Prentice Corp. has announced price cuts ranging from 13% to 45% on its line of modems and multiplexers.

The largest reductions are for the 9,600 bit/sec V.29-compatible microprocessor-based modem, which was cut from $4,950 to $2,695.

The firm's Bell 212-compatible modem, the P212A, has been cut from $710 to $600 and the P-212C modem has been cut $100 to $626 and $710 for rack-mountable and stand-alone versions, respectively.

The vendor is located at 266 Caspian Drive, Sunnyvale, Calif. 94086.



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Able Controller Handles Q-Bus

IRVINE, Calif. — Able Computer, Inc. has announced the Able Q/DH, a microprogrammed asychronous controller that reportedly makes DH-class performance possible on Digital Equipment Corp. PDP-11/23 and LSI-11/23 Q-Bus systems.

The unit connects any Q-Bus system to up to 16 asychronous communications lines with direct-memory access output capabilities. The Q/DH is fully software-compatible with DEC established drivers and modem control is standard on all lines, the vendor said.

The unit costs $1,850, according to a vendor spokesman. Able is headquartered at 1732 Reynolds Ave., Irvine, Calif.

TSD Unveils Touch Panel

BOHEMIA, N.Y. — TSD Display Products, Inc. has unveiled a touch-screen digitizer that reportedly is capable of being mounted to any 12-in. standard CRT display monitor.

The digitizer consists of a thin, transparent curved panel that is connected to an electronic board via a cable. When the panel is touched, the location of the touch is measured and sent to a host computer as an RS-232C messsage, the vendor said.

The price of the digitizer is $775, a vendor spokesman said. TSD is located at 35 Orville Drive, Bohemia, N.Y. 11716.

Module Handles Data Transfer

ORANGE, Calif. — MDB Systems, Inc. has introduced a systems communications module that is compatible with the Digital Equipment Corp. LSI 11/23 microcomputer.

The MLSI-SCM11 has an RS-232 20 mA current loop interface for connection to a system console device. Transfer rates are switch selectable from 38.4 to 110 bit/sec by edge-mounted switches, which precludes powering the system down and removing the board to change data transmission rates, a vendor spokesman said.

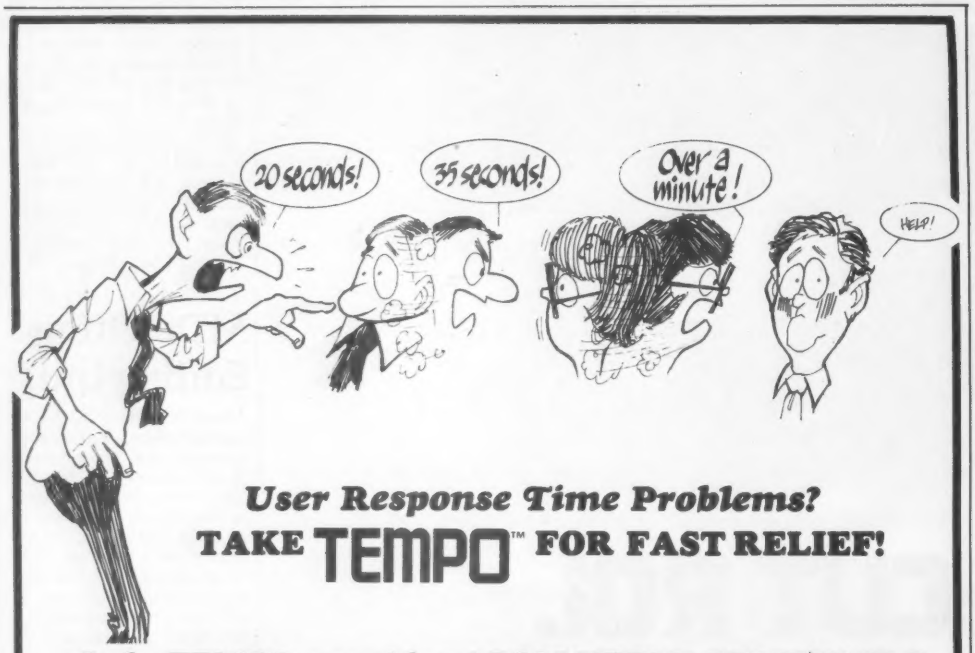
The unit is available for $450, a spokesman said from MDB Systems, Inc., 1995 N. Batavia St., Orange, California 92665.

TRS-80 Gets Printer Terminal

FORT WORTH, Texas — The Radio Shack Division of Tandy Corp. has announced the PT-210, a portable printing terminal designed for the firm's TRS-80 microcomputer.

The unit features a full-size Ascii keyboard that can generate a total of 99 codes, including 67 printable characters and 32 terminal characters. A nonimpact thermal printer reportedly is built into the unit featuring 71 printable characters and a print speed of 50 char/sec. A 110/300 bit/sec acoustic coupler, which is compatible with the Bell 103A standard, is also included. An optional add-on RS-232C interface module is available for $70, according to the vendor.

The terminal costs about $1,000 from Radio Shack at 1800 One Tandy Center, Fort Worth, Texas, 76102.



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Analyzer Gets Diagnostics Set

ALEXANDRIA, Va. — Atlantic Research Corp. has announced a diagnostics module, called Option 24, for its Interview 4500 data analyzer. The unit is used for diagnostics on Digital Equipment Corp.'s DDCMP protocol.

Features of the diagnostic module include a protocol trace display, automatic control header generation and expansion, automatic block check generation and testing, real-time data display, traffic measurements and line utilization and synchronous and asychronous operation, the vendor said.

Option 24 costs $800 for a factory-installed unit or $1,200 for a field installation. The Interview 4500 costs $45,000, the vendor said from 5390 Cherokee Ave., Alexandria, Va. 22312.

Recorder Runs As Stand-Alone

MONTGOMERYVILLE, Pa. — Digilog, Inc. has introduced a stand-alone digital data recorder that uses two minidiskettes for data storage. It connects directly to the RS-232 line or to any vendor's protocol monitor or data communications test set and records EIA status as well as data, the vendor said.

The Digilog MSU IV has a storage capacity of 409,600 data characters plus 409,600 status bytes without changing diskettes. An automatic setup capability allows the MSU IV to work with any protocol or code in synchronous or asynchronous mode without operator intervention, according to a vendor spokesman.

It allows the user to record data characters and interface status at high line speeds, up to 72K bit/sec., and then play the data back for analysis at a lower viewing speed. While it plays back the data, the RS-232 interface status is regenerated in real time, a spokesman reported.

The unit is available for $4,295, the spokesman said from Digilog, Inc., 1370 Welsh Road, Montgomeryville, Pa. 18936.

Utilizes Ada Capabilities

Micro System Boasts 50% of VAX's Speed

ROCKVILLE, Md. — Intellimac, Inc., a six-year-old company here, has introduced a high-performance, multiuser, multiprocessing computer system that is based on a 16-bit microprocessor and is said to have 50% of the speed of Digital Equipment Corp.'s VAX-11/780 superminicomputer.

The IN/7000M incorporates Motorola, Inc.'s 68000 CPU and reportedly supports two different software environments: Bell Laboratories' Unix Version 7 and the Ada programming language, which is marketed by Telesoft, Inc.

The system's hardware reportedly takes full advantage of Ada's multitasking capabilities and features high-speed disk I/O to enhance the multiuser operations common to Unix.

Additional languages available under Unix are Fortan 77, Cobol and Pascal, a spokesman added.

Benchmark Tests

In benchmark tests using a triple-nested loop written in the C language under Unix Version 7, a one-CPU IN/7000M system performed at half the speed of DEC's VAX-11/780 machine, the spokesman claimed.

Standard equipment with the system includes: a 21-slot Intel Corp. Multibus card cage, an M68000 processor card with memory management and up to 256K bytes of on-board random-access memory, an eight-port intelligent serial I/O card, 1M byte of error detection and correction memory, a four-port storage module disk-type Winchester controller and a floppy disk controller.

The high-speed system is said to also have a 160M-byte Winchester disk drive with an average access time of 27 msec and a 16M-byte Control Data Corp. Lark Winchester disk drive that features 8M bytes of removable and 8M bytes of fixed storage. Both disk systems are said to have a transfer rate of about 1.2M byte/sec.

The computer also includes an integral 1.6M-byte floppy disk drive capable of reading disks with DEC or Intel formatting, the spokesman said.

The multiboard design of the IN/7000M reportedly allows multiple M68000 boards to be connected to the same bus. Individual tasking can be performed on each CPU board, however, and users can access up to 8M bytes of global memory, the spokesman noted.

A complete single-processor system with the Unix software, a C compiler and optimizer, a 68000 assembler and other development tools costs $49,695, the spokesman said.

The same system, but with Telesoft-Ada and Pascal and the Telesoft programming support environment lists for $50,440, he noted.

Additional information on the system and details of the benchmark tests can be obtained from the firm at 6001 Montrose Road, Rockville, Md. 20852.

Power System Announced by Best

BURR RIDGE, Ill. — Best Energy Systems, Inc. has announced a power protection system for backup and line conditioning for computers, electronic scanners, point-of-sale terminals and emergency lighting.

The Outage Protection System (OPS) comprises two series: OPS I protects against power losses caused by power brownouts and blackouts, and OPS II provides OPS I's protection plus line conditioning for computer equipment against line spikes, sags, surges and noise.

Both models are available in 14 sizes, from 500 to 12,000W, in either a compact or regular size model. Prices start at $1,900. Marketing is being done by Seps, Inc., Suite 47, 241 Frontage Road, Burr Ridge, Ill. 60521.

DDP Graphics Terminal Fits CAD, Scientific Bill

COSTA MESA, Calif. — A distributed data processing (DDP) graphics terminal designed for the requirements of computer-aided design, simulation and scientific applications has been announced by Genisco Computer Corp.

The G-6100 series terminals are said to feature high-speed raster refresh control, graphics data processing, segmented display-list management and system monitor and diagnostics.

The terminals feature a selection of 64 hues, 19-in. diagonal screen, function keys, numeric pad, LED indicators and a variable-rate joystick. Prices start at $23,250 from the firm at 3545 Cadillac Ave., Costa Mesa, Calif. 92626.

Desktop Offers Color Graphics

SUNNYVALE, Calif. — A desktop station for computer-aided design applications has been introduced by Advanced Electronics Design, Inc. (AED).

The AED Station 11 (AEDS11) offers color graphics and imaging capabilities through the system's Digital Equipment Corp. LSI-11/23 minicomputer, Winchester and floppy disk storage and built-in communications and graphics facilities, according to the vendor.

AEDS11 runs under DEC's RSX-11M, RT-11 and RSTS-E operating systems, as well as Bell Laboratories' Unix, Venturecom's Venix, Microsoft Corp.'s Xenix and S&H Computer Systems, Inc.'s TSX+ operating systems. AED's terminal access package provides Fortran calls to AEDS11 command protocol.

Until Sept. 30, the introductory price for the hardware system is $24,800. AED is located at 440 Potrero Ave., Sunnyvale, Calif. 94086.

Reader/Punch Unit Makes Debut

NASHUA, N.H. — Facit/Dataroyal, a joint venture of Facit, Inc. and Dataroyal, Inc., has combined a tape reader and a tape punch into a single tabletop machine.

The Model 4045 combination tape reader and punch incorporates Facit's Model 4031 basic tape reader and Dataroyal's Model 4045 reader head. The reader head is mounted on the front of the unit next to the chad box, making the 4045 combination into a tabletop unit, according to the vendor. Data can reportedly be entered via one or two channels, or both simultaneously, with a total buffer capacity of 4K bytes.

This product is priced at $2,595, the vendor said from 235 Main Dunstable Road, Nashua, N.H. 03060.

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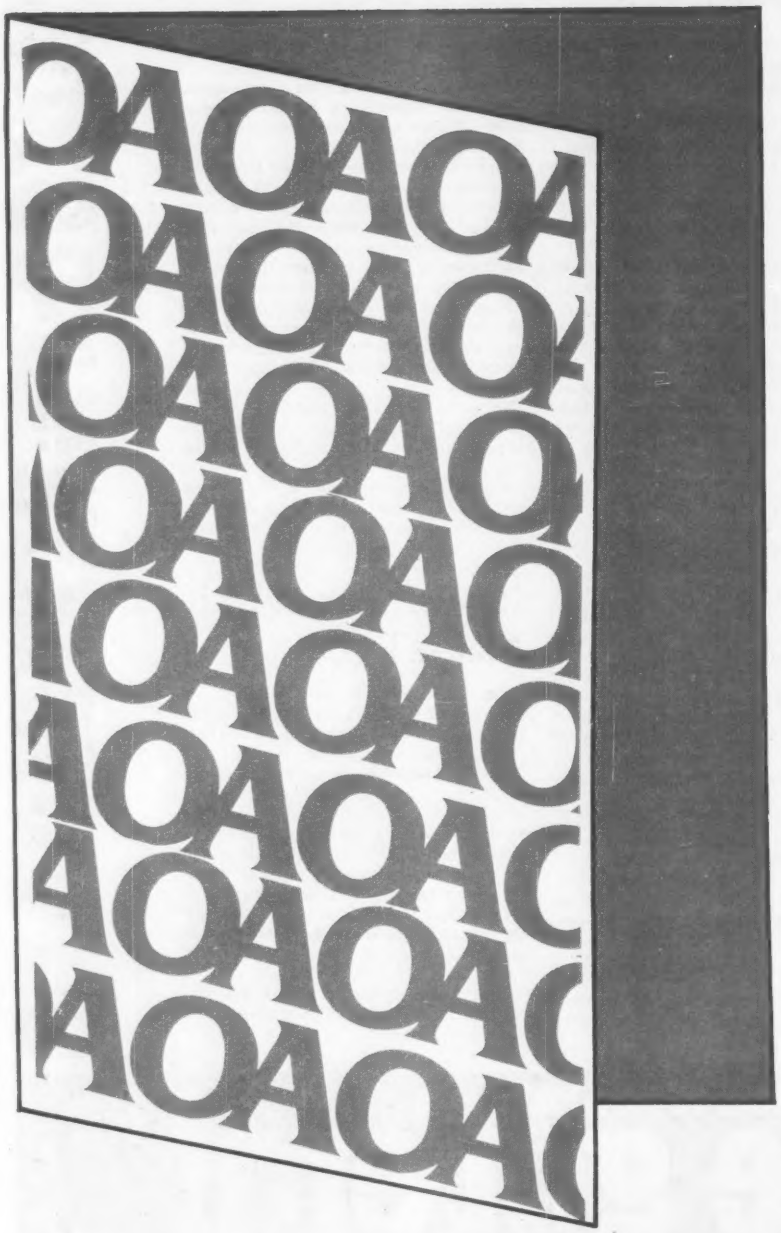

The next issue of *Computerworld OA* will focus on selling office automation within an organization. This special report will feature the human angle of office automation and highlight the strategies of selling the concept of OA to top management and end-users in an organization. You'll see articles on implementation techniques, feasability studies, human interface, ergonomics and productivity.

And, of course, you'll see several articles on current happenings in all aspects of OA.

There will be bonus distribution of this issue to attendees of the Info '82 Show in New York this October. So, if you're a supplier of OA products and services, you won't want to miss the opportunity to advertise in *Computerworld OA's* next issue.

The issue date is September 29th. The deadline date to remember is August 20th for space reservations. (Materials are due August 27th.)

For more details on *Computerworld OA* and the people who read it, just contact your local *Computerworld* representative, or call Bob Ziegel, Vice President at (617) 879-0700 for all the information.

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MINIWORLD

Adam Boasts 128K Bytes of RAM

SUNNYVALE, Calif. — Logical Business Machines has unveiled a high-performance multiterminal business computer system featuring up to 128K bytes of random-access memory. It can be programmed in a variety of languages.

Called Adam, the microcomputer-based system can handle up to four workstations, a 20M-char. Winchester disk drive and a 20M-char. streaming tape drive. Each user workstation can be configured with CRT display that can be used either vertically or horizontally, a detachable keyboard, printer and external communications port, the vendor said.

The firm's "natural" language allows users to communicate with the system in English or one of 22 foreign languages. Adam is upward compatible with the company's two previous systems — David and Tina — and includes the firm's Powerfail backup system that reportedly eliminates the loss of work in progress in the event of a power failure.

The basic Adam system costs $19,000 from the firm at 1294 Hammerwood Ave., Sunnyvale, Calif. 94086.

Suitable for OA Functions

Tab Adds CPU to 132/15 Unit

PALO ALTO, Calif. — Tab Products Co. has added a processor to its existing 132/15 CRT terminal to form two families of integrated desktop computers that combine 132-col output with CP/M or other Digital Research, Inc. operating systems.

Billed as Tab's first true computing systems, the Model 800 and 1600 series machines boast an assortment of mass storage and data communications features that reportedly make the products suitable for office automation functions.

Both the 800 and 1600 series operate as free-standing units or tie into existing host mainframes, according to a Tab spokesman. The two product families are also geared to professional business users and will be sold both to large, sophisticated end users and to OEMs.

At present, the 800 series consists of just one model — the 830, a single-user system built around an 8-bit Intel Corp. 8085 microprocessor. The 1600 series, meanwhile, consists of three models — the 1630, 1650 and the soon-to-be-announced 1660 — which incorporate a 16-bit Intel 8088.

Like the 830, the 1630 supports just one user at a time, while the 1650 accommodates a practical maximum of six users, the spokesman said.

All three system models come standard with two RS-232 asynchronous communications ports and support an optional controller board with up to six additional RS-232 or RS-422 ports. Some of the optional ports permit either asynchronous or IBM bisynchronous communications, while others support synchronous transmissions with IBM 2770, 2780, 3740 and 3780 emulation.

A Systems Network Architecture/Synchronous Data Link Control capability is expected to be added to the Tab systems as early as the first of next year, the source said.

The three system models also incorporate the same 15-in., 132-col display screen and provide both an 8-in. floppy and a 5¼-in. hard disk unit as standard equipment. In a basic configuration, the 5¼-in. disk system stores 5M bytes, expandable to

(Continued on Page 62)

Control, Security and Audit — Part 3

Question of Auditability Paramount

By Nander Brown
Special to CW‡

You have decided which minicomputer system to buy, outlined plans for its control and are about to put your signature to that all-important contract. But, are you really prepared to turn over all your books to a machine?

Before making a final decision on a computer, management must first determine if the machine, as it was designed, is auditable. That is, can you keep track of its security and monitor how it is being used by your staff.

To be auditable, the proposed system should meet two prime objectives:

- It must have a network of internal controls that are adequate to ensure the results of the system will be reasonably accurate and reliable.
- The planned management/audit trail should satisfy management's needs and enable an auditor to perform an effective audit.

In this, the last part of a three-part series on the control, security and audit of minicomputers, Brown discusses the auditability of a computer system, security and risk analysis.

Auditability includes techniques such as file inquiry, sampling, matching routines and the capability to verify totals. Before signing the bottom contractual line, managers should make sure that:

- Auditing procedures are detailed, clear and concise.
- The system has been designed so that erroneous data is corrected and reentered into the system in a timely manner.
- Automatic audit techniques are incorporated into the system's design.
- System documentation includes a separate section that addresses internal controls and audit trails.
- The data processing activity has a firm plan for updating and maintaining system documentation.
- Management has a means to evaluate system performance.
- There is a clear-cut way to trace transaction flow from its source to its ultimate end.

Security Procedures

Security procedures should be prepared and periodically updated, and users should be held accountable for their activities. The physical and logical access to a computer and its resources should be controlled and monitored.

In terms of security priorities, emergency backup and recovery must be considered paramount. The continued operation of the system is essential despite any destructive occurrences and regardless of their nature or origin. Emergency preparedness should be planned by management and

(Continued on Page 64)

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Mini Line Gets Retrofit Memory

SANTA BARBARA, Calif. — Polymorphic Systems, also known as Interactive Products Corp., has announced a retrofit memory package for its line of microcomputers.

Designed to replace the firm's 5¼-in. minifloppy disks, Polymorphic has announced the HD/18, a 215K- to 18M-byte hard-disk subsystem. The unit has a four-platter stack of Winchester disks and features a full-step positioner. A buffered step mode is included to increase throughput, the vendor said.

The subsystem comes with a 5M bit/sec data transfer rate and $3,995 for an 18M-byte configuration, the vendor said from 5730 Thornwood Drive, Santa Barbara, Calif. 93117.

Subsystem Out For IBM Micro

COLUMBIA, Mo. — Columbia Microsystems, Inc. has announced the CMS 1600-IBM, an 8-in. disk drive subsystem for the IBM Personal Computer.

The subsystem features 2.4M bytes of on-line storage on two 8-in. floppy disk drives. The subsystem also provides an ac outlet for a monitor, a low-loss power supply and power-line filtering, the vendor spokesman said.

The unit costs $1,750 or $2,095 for a basic subsystem, controller and driver software for Digital Research, Inc.'s CPM/86 and IBM's PS-DOS operating systems. The vendor is located at 110 N. 10th St. Columbia, Mo. 65201.

Pocket Size

HP Portable Computer Out

PALO ALTO, Calif. — Hewlett-Packard Co. has entered the fast-moving portable computer field by introducing a pocket-size computer that features a typewriter-like keyboard and a memory of up to 120K bytes.

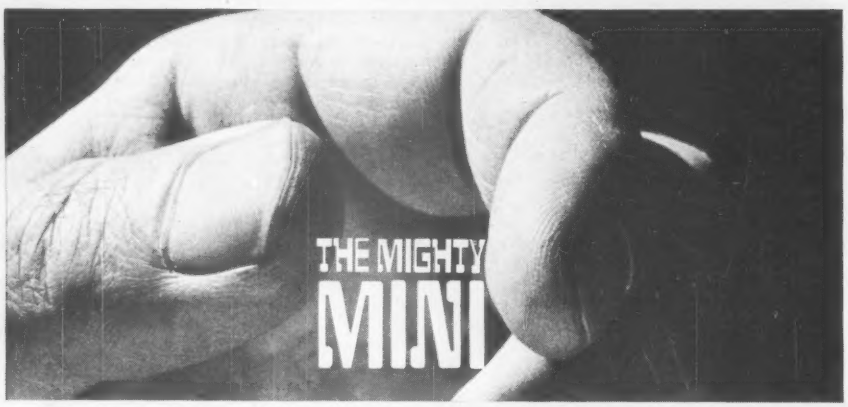
The HP-75C has a read-only memory-based operating system that incorporates 169 instructions, 147 of which are Basic commands, statements or functions, a spokesman for the vendor said. The unit has 16K bytes of random-access memory (RAM) built-in, which can be expanded to 24K bytes with a plug-in module, a 48K-byte operating system and up to three 16K-byte plug-in "custom" modules.

The device has a 32-char. liquid-crystal display and a hand-pulled magnetic card reader that can accommodate up to 1.3K byte/card. Other features of the unit include a real-time clock, nonvolatile memory and a built-in HP interface loop. The interface loop allows the small computer to be linked to a variety of the firm's peripherals, including a printer, plotter and CRT terminal, the spokesman noted. The HP-75C can also be used with standard TV sets via HP's video/TV interface.

The 26-oz computer has a programming capability, which is made possible through its Basic operating system. Plug-in software modules will also be offered to adapt the machine to specific applications and industries.

The HP-75C costs $995. The 8K-RAM expansion module costs $195. Peripherals, such as a digital cassette tape drive, printer and CRT monitors, are priced from $295 to $795.

Additional information on the pocket computer can be obtained from a local HP sales office.



Cut the Purchase Decision On Minis and Small Business Systems Down to Size

According to International Data Corporation, the market for small systems has become one of the hottest areas in the computer industry today. There's a proliferation of systems to choose from. And it's getting harder to tell the difference between micros, the larger small business computers and minicomputers.

Making purchase decisions has become really tough — each day you delay in purchasing literally means more systems to choose from; more systems to investigate. *Computerworld's* August 30 Special Report on Minis and Small Business Systems is just what you need to clear up the confusion that you're faced with when deciding on the best system to meet your needs.

You'll get comparisons between minicomputer-based and microprocessor-based systems. You'll learn how to make decisions on systems that fit your needs not just for now, but also for the future. And there's more. Take a look at the kind of information you can look forward to in this issue:

- What to watch out for when negotiating contracts with vendors — especially where software is concerned.
- Application stories from users who've travelled the route — accountants, medical people, financial people. You'll even hear users from small mom and pop operations.
- The legal perspective — what happens when you *do* have problems with your contract (with special attention to software).
- A set of guidelines for judging the quality of the advice you're getting so you'll know who to listen to: Consultants? Vendors? Users? Friends of the family?

This *Computerworld* Special Report won't tell you *what* to buy, but it will do an excellent job of telling you *how* to buy. If you're planning to purchase small business systems in the future, you can't afford to miss this special report.

And if you sell to buyers of minis and small business systems, this is where you'll find your best prospects on August 30 — reading *Computerworld's* Special Report on Minis and Small Business Systems. Will the information they get be complete without news of your product? Ad close for this Special Report is August 13.

Contact your local sales representative at one of the offices listed below, or call Don Fagan, Vice President, Sales at (617) 879-0700.

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Mats Designed For DEC CPUs

MILPITAS, Calif. — System Industries, Inc. has announced a multiple-access tape system (Mats) for Digital Equipment Corp. processors.

Mats reportedly is based on a 125 in./sec, triple-density (800, 1,600 and 6,250 bit/in.) tape drive that permits at least two DEC processors to share a common tape system. It costs $30,000 from the vendor at 1855 Barber Lane, Milpitas, Calif. 95035.

Tab Adds CPU To 132/15 Terminal

(Continued from Page 61)

10M bytes.

The 8-in. floppy unit, meanwhile, holds 630K bytes, expandable to 1.2M bytes. As an option, users can substitute a 5¼-in. floppy for its 8-in. counterpart, the spokesman said.

Both the 5¼-in. hard disk unit and the 132-col display screen contribute to the Tab systems' ability to link to installed host processors. The integrated disk unit enables the desktop systems to pass information to and from corporate data bases.

The 15-in. screen width, by contrast, spares central systems — which are typically geared to 132-col output — from having to reformat data to fit a smaller display, the spokesman said.

Product Configurations

A basic 830 configuration containing a 64K-byte CPU, 5M-byte hard disk, 630K bytes of floppy storage and the CP/M 2.2 operating system costs $7,500.

A minimum 1630 configuration with the same disk specifications, a 128K-byte CPU (expandable to 768K bytes) and CP/M-86 sells for $7,785.

A similarly configured 1650 with Digital Research's multiuser MP/M-86 operating system and two terminals costs $9,800. Deliveries of the three desktop system models will begin this fall from Tab at 1451 California Ave., Palo Alto, Calif. 94304.

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Apple's Professional Solution Discounted for Three Months

CUPERTINO, Calif. — Apple Computer, Inc. has combined existing hardware and software modules to form a packaged microcomputer system that will be sold at a discount between Aug. 1 and Oct. 31.

The company's Professional Solution System incorporates a 256K-byte Apple III, an integrated 140K-byte floppy disk unit, an Apple 12-in. Monitor III CRT terminal and application packages for word processing, financial modeling and data management.

Bought together as a package, the constituent hardware and software modules cost more than $300 less than the same collection of products acquired separately, a spokesman for Apple said.

The system is reportedly available with three widely used application packages: Apple Writer III, a word processing program; Visicorp's Visicalc III, an electronic spreadsheet; and Apple's Quick File III, which turns raw data into finished files and reports.

Under ordinary circumstances, the packaged system would cost more than $5,300. But through the last day of October, the same configuration will be available at the reduced price of $4,995.

The limited offer for the specially priced packaged system has been authorized by Apple, 20525 Mariani Ave., Cupertino, Calif. 95014.

What Should an Auditor Examine Before Establishing Procedures?

Security of any minicomputer system should be focused on management control and asset protection. To achieve this, there are several basic things an auditor should review before establishing concrete procedures:

- Pertinent system documentation and operating procedures.
- Day-to-day practices associated with the operation of the minicomputer installation.
- Internal controls and audit trails resident in key applications.
- The testing of controls for their effectiveness.
- The level of security associated with computer operations.
- The management of control and periodic reviews tailored to the installation.

Ask if the Mini Is Auditable

(Continued from Page 61)

reviewed by an outside DP specialist for adequacy. Equipment backup should be stressed and not just the kind that provides for duplicate equipment standing idly by at another site.

Managers should be aware that their computer systems are just as enticing a target for computer crime as the neighborhood automatic teller machines or bank's computers.

Experts on computer crime said that the annual rate of computer-related crime, both detected and undetected, probably exceeds $10 billion in the U.S. These crimes can involve the alteration of source documents, changing computer programs, alteration of data files, destruction of vital records and even illegal use of a computer's time.

Protection

So how does an organization protect itself from what might seem to be the inevitable?

One way is the "fire-fighting" approach, which involves the identification of vulnerable areas following the occurrence of a disaster or after some abuse has been discovered. This is also called locking the barn door after the horse has escaped. For obvious reasons, this method is inadequate. However, one way to nip crime before it occurs is through risk analysis.

Risk analysis is basically an assessment of threats and vulnerabilities of a specific facility or organization and deals with a unique set of assets and conditions.

Assets Outlined

The "assets" include data, software, equipment, buildings and so forth. In the assessment, each physical part of the computer environment and step in the programming and operation process is identified and then a specific set of risks are identified. Implicit in this method is a cost/benefit analysis of potential losses and alternative safeguard measures.

In summary, an auditor should adhere to three broad audit objectives:

- To ensure management that its policies and procedures are being followed.
- To verify the integrity and reliability of files and information.
- To verify the presence and effectiveness of controls and audit trails.

No matter what type of system is involved, security should be focused on management control and asset protection.

Brown is currently assistant general auditor for the Federal Home Loan Mortgage Corp. in Washington, D.C., and was previously the regional manager for the Washington office of EDP Audit Control, Inc. where he directed the audit activities for commercial as well as government clients.

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Despite Early Hitches

State Agency 'Pleased' With Ethernet

By Bruce Hoard
CW Staff

FRANKFORT, Ky. — With five Xerox Corp. Ethernet local-area networks operating in five buildings and two of those communicating over gateways, Kentucky's Department of Information Systems is pushing ahead with a state-of-the-art office communications system.

The project officially began on Feb. 1 with the installation of 11 Xerox 860 workstations and on-site training.

After bringing the first Ethernet up in June, Information Systems produced more than 300 flowcharts for Kentucky's Statewide Financial Information System, according to Dobree Adams, director of the Division of Systems Planning and Administration.

The detailed flowcharts required extensive use of graphics and text and the project was initiated prior to equipment burn-in and adequate training on the 26 Xerox 8010 Star professional workstations being used, Adams said.

In the beginning, there were problems with hardware and establishing production procedures for tracking, developing, editing, revising and storing the charts.

"The response time was really terrible at first," the director said, adding that there were difficulties in transferring files from the Stars to the Xerox 860 workstations also being used.

However, most of the bugs have been corrected by the company's software Release 3.0, the director commented. "We're very pleased now," Adams said.

The two communicating Ethernets are running through modems and a dedicated 9,600 bit/sec telephone line. The first one has six 860s and six Stars. The second has three 860s and seven Stars.

Now that the graphics project is finished, Adam's department is focusing on integrating the office automation technology into the state's main business development. To that end, the workstations are being used to develop lots of systems documentation, she observed.

Xerox is working with the state to have full IBM 3270 Synchronous Data Link Control/Systems Network Architecture compatibility by the end of the year. "I have always wanted one and only one terminal on my desk," the division director declared. "We need to be assured that communications with our IBM 370 central computer facility is fully supported by Ethernet."

Star Training 'Tedious'

She said there has been heavy demand from 200 DPers in the Information Systems department who want to get on the Ethernets. One of the things that has held up more participation was Xerox's Star training. "The training Xerox has for the Star is really tedious," she said, adding that three to five hours is too long for anxious professionals.

In order to get around that, the department is developing in-house training featuring "how-to action cards." Xerox has also provided an abbreviated reference guide.

Asked if productivity has increased with the new systems, Adams replied, "There's no doubt about clerical productivity gains."

In the use of the Stars, she said, division directors have noted a marked increase in the quality of the documents created, but at this point substantial productivity gains are not obvious.

Only a Pilot Project

She will attempt to document those gains in a survey that is currently being circulated. And, although things look good now, she stressed the fact that this is only a pilot project. "If it doesn't fly, it's goodbye," she said.

Wiring the five buildings with coaxial cable for the Ethernets was no problem for at least two of the buildings, which already had raised floors. It was not so easy in the case of another, older building where "aesthetic" concerns had to be considered. The firm ended up putting cable through wire molding, a process Adams referred to as "expensive and time-consuming."

Adams said the state originally went with Xerox because the company "was there and ready to go" with the network and the workstations.

Directory Edition On Mail Execs Out

NORWALK, Conn. — The fourth edition of the *Electronic Mail Executives Directory* was announced by International Resource Development, Inc., a market research and consulting firm here.

The directory is said to contain information on the electronic mail and message system requirements of the top U.S. corporations and identify 3,000 decision-making executives in charge of voice and data communications, office automation and in-house printing.

It gives these executives' comments regarding plans and activities for purchasing electronic mail and message system products and services. The directory also includes their names and addresses, the vendor said.

The directory is available for $95 from International Resource Development, located at 30 High St., Norwalk, Conn. 06851.

Monroe OC 8820 Gets WP Aid

MORRIS PLAINS, N.J. — Monroe Systems for Business has introduced a word processing package for its Monroe OC 8820 Occupational Computer.

Monroe Superword is a version of Wordstar from Micropro International Corp. Editing features include column manipulation, global search and replace and paragraph move, copy and delete. It also handles statistical typing, giving the operator the capability of entering information with automatic decimal alignment.

Document formatting includes features for automatic page numbering, headers and footers, centering, boldface, automatic indent, super and subscripts and on-screen right-margin justification.

For applications where text merging is required — such as direct-mail campaigns, sales promotion letters and legal documents — Supermerge, the optional merging program, allows the user to combine names, addresses or other fields of information into the standard text, according to the vendor.

Superword costs $520 and Supermerge costs $150, Monroe said from The American Road, Morris Plains, N.J. 07950.

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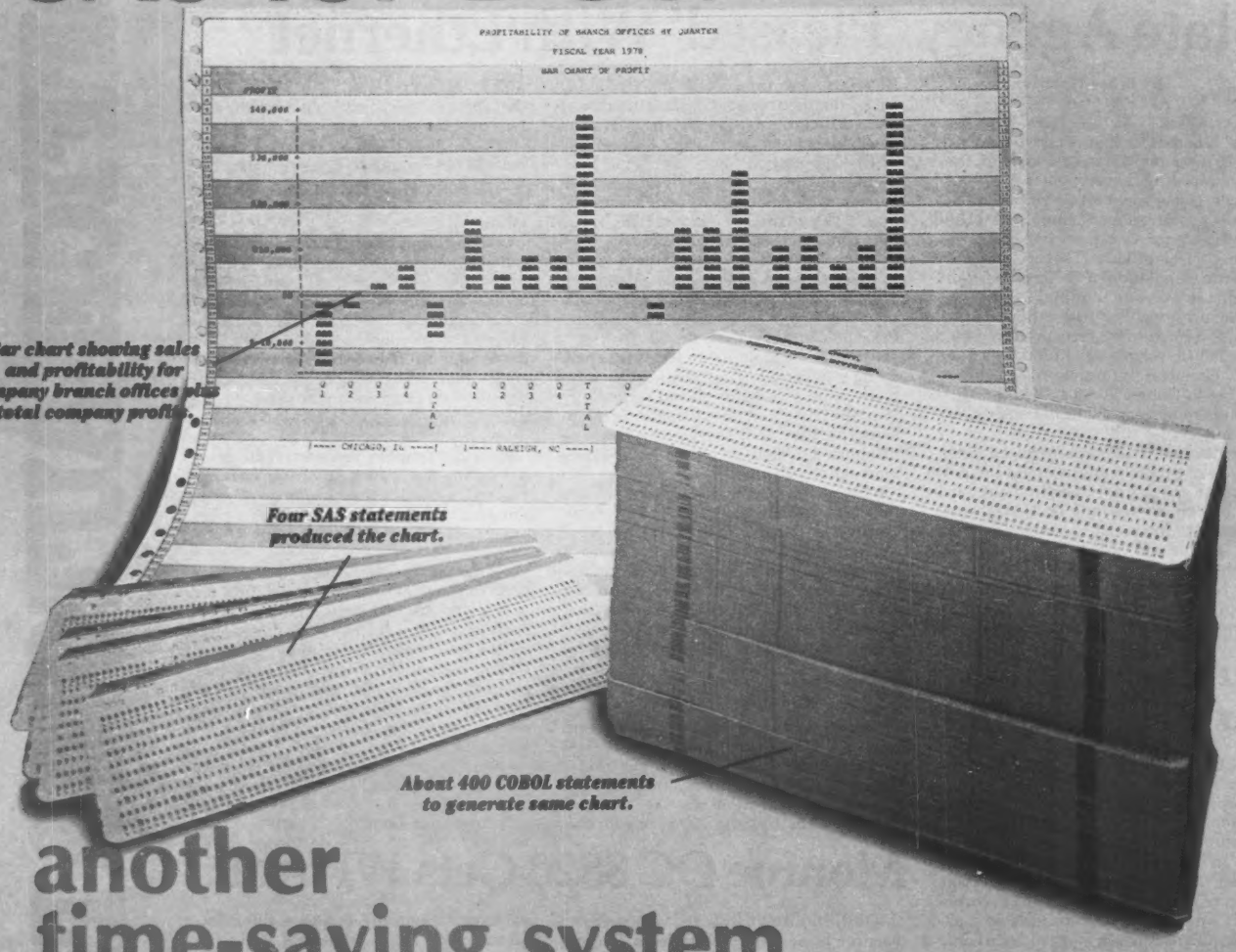

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Burroughs Slaps Ibis With Secrets Suit

By Marcia Blumenthal
CW Staff

LOS ANGELES — Ibis Systems, Inc., the fledgling high-end disk maker located in Duarte, Calif., has been socked with a second lawsuit for trade secret infringement in federal court here. This time the plaintiff is Burroughs Corp.

The recently filed Burroughs action follows hot on the heels of a settlement Ibis recently made with Storage Technology Corp. (STC). The Colorado disk maker had alleged Ibis made use of proprietary STC technology and also caused damage to the firm by hiring away several employees. However, the two companies settled their differences out of court [CW, July 19].

The Burroughs suit asks for damages in excess of $20 million and the establishment of a trust in Burroughs' name, making the corporation the sole beneficiary of any profits or benefits Ibis derives from the use of Burroughs technology.

The technology in this case, according to a statement from Burroughs, "involves recording of data in a thin magnetic film on the surface of a rotating disk using a recording head operating millionths of an inch from the disk surface."

Burroughs declined to comment further on the suit.

Ibis President and Chairman of the Board Jack Jones said his firm was confused by the action. "We've been in business a year and a half and Burroughs just instituted the suit. Everyone [in the disk business] has been aware of our technology. We expected some kind of an action from Burroughs when we first started, but not now."

Jones said he did not think the suit had anything to do with the fact that he was formerly employed at Memorex Corp. as a marketing director and the company's executive vice-president, Jack Taranto, had been an executive at Burroughs. "I have to believe it's a harrassment," he added.

Moreover, he asserted that before the firm was funded by its venture capital partners, there was a thorough check of the technology and existing patents.

The Burroughs action has few specific charges, according to a Burroughs spokesman. In the meantime, Ibis is preparing its response, which will be filed within the next two weeks.

Univac Lets Go 1% Of U.S. Work Force

BLUE BELL, Pa. — In a continuing round of layoffs, Sperry Univac said it had let go of 1% of its U.S. work force late last month, citing weak economic conditions and consolidation of its new product development as reasons for the reduction.

Less than 400 people were involved in the most recent layoff, primarily in the product development and marketing support areas, a spokesman said. About 100 terminations were made at headquarters here, with other reductions made in the Twin City area and other regional locations.

The spokesman said the layoffs were made across the board and claimed no one product line was involved. However, a consolidation in the engineering activities of the Series 90 and 1100 systems reportedly was responsible for some of the layoffs.

Prior to the most recent layoffs, Univac had cut its work force by 1,100 workers during the past year and a half.

Justice Probes Six Japanese Firms For Chip Export Price Fixing

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — Semiconductor industry executives on both sides of the Pacific were caught off guard when the U.S. Justice Department notified Tokyo it is investigating six Japanese firms for possible price fixing in connection with the export of 64K random-access memory (RAM) chips.

The companies under investigation by the department's Antitrust Division are Fujitsu Ltd., Hitachi Ltd., Mitsubishi Electric Corp., Nippon Electric Corp., Oki Electric Industry Co. and Toshiba Corp. The inquiry reportedly centers on the possible collusion of these firms to raise prices and to hold down export volume of the heavily in demand 64K RAM chips.

Until recently, U.S. chip makers have been complaining the Japanese products were priced too low, undercutting American competition and making it uneconomical for U.S. firms to increase production. The short supply and the rapidly increasing demand for the memory chips created a tight market both here and in Japan.

Given this situation, U.S. industry spokesmen were puzzled to hear of the Justice Department investigation. Tom Henkelman of the Semiconductor Industry Association (SIA) said the government inquiry was completely unexpected. Although several federal agencies, including the U.S. Trade Representative's Office and the Commerce Department, have been looking into Japanese marketing of 64K RAM chips, collusion to raise prices was not part of their studies, he said.

Henkelman said he has no reason to believe the investigation will turn up any evidence of wrongdoing by the Japanese companies. He did say, however, that the SIA's monitoring of the Japanese trade press indicated demand greatly exceeds supply of the chips there, as well as in the U.S., making it difficult to speculate on what evidence Justice might have of possible price fixing.

Similarly, Michael Tsukamoto, a spokesman for the Electronics Industry Association of Japan, said it is hard to believe the investigation might turn up any wrongdoing by the six companies. He maintained the market for the memory devices is too tight and too competitive to make price fixing feasible.

Reached at the Japanese Electronics Bureau in New York last week, Tsukamoto said Japanese semiconductor manufacturers are "frustrated" by what they perceive as mixed signals from the U.S. government. On one hand, American trade officials pressure Japanese firms to raise their prices and, on the other hand, the Justice Department investigates the firms for allegedly pricing their products too high.

These conflicting U.S. government actions make it impossible to tell what American policy is, according to Tsukamoto, who said the firms targeted by Justice "strongly deny [the] allegations."

Twelve Give Support

Graphics Standards Gain Ground

By Tim Scannell
CW Staff

BOSTON — Xerox Corp., Westinghouse Electric Corp., International Computers, Ltd. and nine other computer hardware and software firms have agreed to pool their efforts to adopt and support standards that concern the creation and transmission of graphics images. They have also agreed to cooperate individually in internal research and development and to incorporate these standards into future products.

The announcement came at the recent Siggraph conference and exhibition, which was held here and sponsored by the Association for Computing Machinery. It closely follows a similar agreement reached earlier this year by Digital Equipment Corp., Tektronix, Inc. and Intel Corp., the three companies that initiated the joint standards effort [CW, May 31].

The other firms joining the three originators include: Digital Research, Inc., Graphics Software Systems, Inc., Hazeltine Corp., Issco Graphics, Mannesman Tally Corp., Microsoft, AEL Microtel Ltd., Precision Visuals, Inc. and Norpak Ltd.

Under the terms of the agreement, the

(Continued on Page 68)

CW Photo by T. Scannell

Officers of leading computer firms discuss graphics standards

Twelve Firms Agree to Pool Efforts on Graphics

(Continued from Page 67)

firms — a total of 15 — have agreed to promote and eventually to establish the use of two emerging graphics standards: NAPLPS and VDI. NAPLPS is a communications protocol that was developed by the Canadian Department of Communication and subsequently adopted and enhanced by AT&T. The proposal is currently under consideration by the American National Standards Institute's (Ansi) X3L2 Committee on character sets and coding, a spokesman said. VDI, on the other hand, was designed to provide standardized access to graphics functions and will reportedly provide more portability of software between systems and graphics devices. It too is being developed by Ansi under direction of its X3H3 Technical Committee that is focused on computer graphics programming languages.

Enthusiastic About Union

At a press conference held to announce the addition of 12 more firms to the standards effort, representatives of each company appeared to be enthusiastic about the union.

"We've hung our hat on standards from the beginning of the '70s and we're with them all the way," said James Warner, president of Precision Visuals, a maker of software graphics tools based in Boulder, Colo.

DEC's William Avery cited the rapid growth of computer graphics — with equipment shipments expected to grow to $14.5 billion by 1989 — and the present lack of graphics standards as two reasons why standards are sorely needed in the industry. "Applications are really the key to growth in the computer market," Avery observed. "And graphics are going to become the key to these applications in the future." It is important that companies "are not continuously reinventing the wheel," he said.

While all of the firms involved in the agreement have pledged to convince other companies to join in the effort, there has been some resistance from outside companies that seem to have adopted a "wait-and-see" attitude rather than commit support, Avery admitted. For example, although IBM has been actively investigating the NAPLPS standard, it has assumed a "passive" stance as far as lobbying for its passage, DEC's spokesman said.

With the addition of 12 firms, the group hopes to have both the VDI and NAPLPS standards on the books by as early as February. However, for the moment, all of the firms are working at putting out some sort of an explanatory diagram by late summer that would simplify how each of the standards might work — especially the highly complex VDI standard, a spokesman said.

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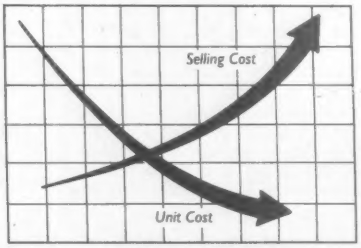

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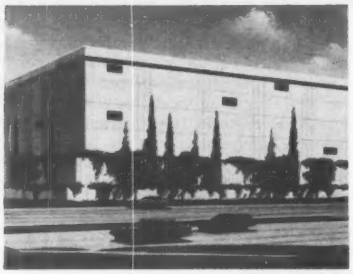

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DEC, Ramtek Announce Pact

BOSTON — Digital Equipment Corp. and Ramtek Corp. have agreed to market jointly the components of a system for computer-aided design and manufacturing (CAD/CAM) applications.

The long-rumored pact between the two vendors was announced at the Association for Computing Machinery Siggraph '82 graphics conference held here late last month.

Under the terms of the agreement, DEC and Ramtek marketing staffs will call on prospects jointly, selling the VAX and a specialized workstation, the Marquis, developed by Ramtek, that will run with DEC's VAX series of systems. The Marquis is a special version of Ramtek's high-end RM-9640 display generator.

In Works Since January

The deal between the two vendors has been under discussion since January. The venture is a result of DEC's intent to enter the high-end CAD/CAM field and Ramtek's goal to expand into the systems business, according to Peter W. Cassady, vice-president of marketing at Ramtek.

Cassady said DEC originally reviewed 22 graphics companies, narrowing down its selection to five vendors and then to two finalists. The two finalists were Ramtek and Lexidata Corp., he said.

For the time being the companies will concentrate on selling the graphics-oriented system for scientific and engineering applications, because the business graphics market is still in its emergent phase.

The deal between Ramtek and DEC is for three years and may involve joint research and development at a later date, Cassady said.

DEC and Ramtek will also sell applications software offered by vendors affiliated with the two firms. Ramtek has agreements with about 25 software vendors, he said.

There are four models of the Marquis — single and dual workstations based on Zilog, Inc.'s Z80 8-bit microprocessor and single and dual stations based on Motorola, Inc.'s MC68000 16-bit processor. Prices for the workstations vary between $38,250 and $57,950.

The Marquis includes a graphics display generator, tablet, keyboard and monitor and VAX interface.

Depending on the power required, users can choose from a variety of VAX systems.

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European Commission Sets DP Market Goal

By Rita Shoor
CW Staff

ST. PAUL DE VENCE, France — The U.S. has a huge continental market and an "immensely powerful federal government that funds R&D[research and development] heavily." Japan has a long-term strategy and knows where it's going. Europe has neither right now, according to Christopher Layton, special adviser on information technology to the Commission of the European Communities.

But things could change if the European industrial community cooperates to implement the strategic program developed by the commission, Layton told attendees here during a recent Sperry Univac seminar targeted on "The Information Technology Society."

Europe is currently in economic "misery," he continued, pointing to a trade deficit of more than $4 billion in 1981. European industry imports over 60% of its integrated circuits and "all of the most advanced circuits," he said. The implication here is that designers in Europe tend to design in an obsolete technology, Layton maintained. In addition, many European consumer electronics firms simply act as vendors of Japanese equipment and European-owned firms control less than 16% of the world computer market.

With control of one-third of the world computer market as a goal for 1990, European information technology firms have their work cut out for them, Layton acknowledged.

Keeping this in mind, the commission has developed a long-term strategic program for research and development in information technologies. Several major European companies in the information technology field worked with the commission to review potential areas of technology with a view to identifying those which were "suitable for a European effort rather than a national one," he said.

Five Sectors

Five sectors that offered a possibility for European industry to close the technological gap with competitors while maintaining independence from foreign sources of supply were identified. These are:

- Advanced microelectronics.
- Advanced information processing systems such as "knowledge systems" and interactive query systems.
- Software technology with a concentration on the portable software tool environment.
- Office automation.
- Computer-integrated flexible manufacturing.

In order to establish a competitive European presence in the world market, the R&D programs in all five areas are very closely related in terms of industrial exploitation, according to the commission. Thus, the results from all five areas should be available at "roughly the same time".

Describing himself as "moderately hopeful" about successful implementation of the commission's program, Layton said that all of the top European companies "seem to be behind the scheme." in a political environment that is also "moderately hopeful" about industrial collaboration.

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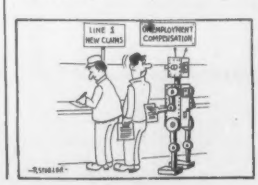
Study Covers Security Market

NEW YORK — Frost & Sullivan, Inc. is offering a study entitled *The Market for Information Security Systems in the U.S.*

The 360-page study maintains that with computer crime on the rise, secure information systems are a market with assured future growth. Mainframe users, in particular, will have to employ some type of systems software for protection, the study claims.

It predicts a four-fold increase by 1986 in the market for encryption products used to secure computer data and information and notes approximately 1,500 encryption devices have been installed to date.

The study, No. 998, costs $1,200 from Frost & Sullivan at 106 Fulton St., New York, N.Y. 10038.



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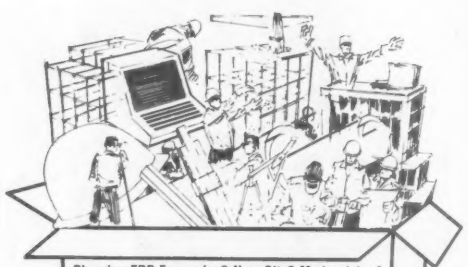
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CDC, Centronics Agreement Triggers Reorganizations

HUDSON, N. H. — The recent finalization of the agreement that gave Control Data Corp. a controlling interest in Centronics Data Computer Corp. has sparked a reorganization in the printer company headquartered here.

Centronics said it has restructured the company, creating three new operating groups and a corporate headquarters group. Two of the new operating groups, the Matrix Printer Division and the Line Printer Division, focus on product development and manufacturing for those two printer lines.

J. Gerard Cregan was named vice-president and general manager of the Matrix Printer Division, while R. James Holbrook was named to the same position in the Line Printer Division.

The third operating group is the worldwide Marketing Sales and Service Operation, a newly formed corporate unit, which will support and expand the user base for both product divisions. Terence Harris was named vice-president and general manager of that group.

The corporate headquarters group includes the finance, human resources functions as well as general counsel and corporate strategy.

Corporate strategy is a new department at Centronics and will be headed by Neil Kleinfeld, vice-president of marketing.

Adapso Asks Federal Reserve To Reconsider Citicorp Ruling

WASHINGTON, D.C. — The Association of Data Processing Service Organizations (Adapso) has asked the Federal Reserve Board to reconsider its recent ruling allowing Citicorp to expand its DP services business.

In a July 9 decision, the board approved the bank holding company's plan to offer an array of sophisticated DP and telecommunications services, including home banking, through a new subsidiary, Citishare [CW, July 26]. Adapso had opposed the plan, arguing that possible tie-ins between the bank's financial and DP offerings might give Citishare an unfair competitive advantage over other DP services firms.

In a July 26 petition to the Federal Reserve Board, Adapso asked for clarification of certain parts of the Citicorp decision. Association President Jerome L. Dreyer said the decision was unclear on several points, giving as examples terms such as "economic data" and "software," which Adapso felt the board did not adequately define as they relate to possible Citishare services.

The board is expected to take several weeks to decide on the Adapso request for reconsideration. Further evidentiary hearings and submissions from the association and Citicorp could be called for if the request is granted.

Dreyer also said the association will definitely appeal the board's July 9 decision in federal court if the reconsideration request is denied.

Supershorts

Threshold Technology, Inc. has signed an agreement with Siemans Corp. to develop a voice-verification device for Siemans that will prevent unauthorized access to data base management and telephone systems.

— — —

Performance Software, Inc. has acquired Workflow, an automated operations documentation system developed by Marcon & Associates, Inc. of Dallas. The system runs under the control of any processor executing the DOS/VS(E) or OS operating system.

— — —

Comserv Corp. has reached an agreement with Cullinane Database Systems, Inc. to sell a number of Cullinane software products in conjunction with their manufacturing software system, Amaps, including IDMS. Cullinane will install the IDMS products, and Comserv will supply and support the IDMS/Amaps interface.

— — —

Data General Corp.'s Information Systems Division has chosen Computer Partners, Inc. and Business Systems Associates to market and maintain its Manap manufacturing applications software package in the Northeast region of the U.S.

— — —

Panasophic Systems, Inc. has reached an agreement in principle to acquire two software products, Slick and OWL, from NCI, Inc. of Atlanta. Terms of the acquisition were not disclosed.

New Companies

Spectra Software is a firm specilizing in applications for the IBM System/23 minicomputer, including accounting packages, time accounting, job cost and client write-up. It is located at Suite 530, 7540 LBJ Freeway, Dallas, Texas 75251.

Vision Computer Systems is a company that provides software applications for specialty subcontractors. The firm is a division of Electrend, Inc., an electrical contracting firm, and is located at 3517 W. Commonwealth Ave., Fullerton, Calif. 92633.

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Independent Profit Centers

Some DP Spinoffs Becoming Moneymakers

By Robert Batt
CW West Coast Bureau

LOS ANGELES — With many large corporations continuing to suffer the effects of a prolonged recession, their DP departments are fast emerging as catalysts for future revenue streams.

A host of DP service divisions have grown up within some of the nation's largest enterprises, often operating as independent profit centers and contributing a substantial cash flow to the corporation as a whole.

Such companies include Continental Airlines, the McDonnell Douglas Corp. and Beneficial Standard Corp.

Greg Newell, manager of DP services at Executive Register Agency, Inc., a recruitment agency, commented: "The companies that have the aggressive market posture are those that have addressed computer technology as the foundation of their future viability. The common denominator in these companies is their disposition toward computer power regardless of their general product line." Newell has done a special study on how firms use their DP organizations to fuel their growth.

Continental Airlines

One example of a company that has placed major emphasis on adopting computing prowess is Continental Airlines, which has established one of the most sophisticated flight planning and seat reservation systems in the airline industry.

Although a relatively small carrier itself, Continental has set up a subsidiary to sell its computer services to other airlines. The subsidiary, called Continental Computer Services, (CCS), is expected to accrue revenues of over $9 million this year. It has a network of 8,000 terminals throughout the world, servicing 20 carriers that take advantage of CCS services for their seat reservations and 75 carriers that use the flight planning services.

The Continental business has attracted the attention of other airlines and other carriers such as United Airlines and Eastern Airlines are now said to be setting up their own DP services group.

The First Airline

Continental claims to be the first airline to use the Programmed Airline Reservation System on IBM's 360 model "We wanted to find a way to share the cost of our system so that the net costs of computing within the company would be lowered," said Charles Connoy, director of software operating systems.

The subsidiary develops its own products such as its Real Time Scheduled Change Package, which allows airlines to run schedule changes online rather than in batch mode.

Another corporation that has set up its own computing subsidiary to provide external services is the insurance company, Beneficial Standard Corp.

Beneficial Computer Services Inc. (BCS), estblished just 18 months ago, arose from the ashes of what the company itself admits to have been a disastrous data processing setup in the 1970s, with computer staff leaving in droves. Lawrence Freed, director of BCS asserted, "Data processing had a bad record, it was a shambles. The major problem was that the senior corporate people didn't have a good idea of what DP should do."

"The parent group had a number of subsidiaries all of which could go outside the corporation to buy computer services. The aim of BCS services is to bring all the computer services and revenues in-house and at the same time to market some of our services to outside companies," Freed said.

Among the services that BCS supplies both in-house and as a commercial proposition to outside clients, notably those in the insurance industry, is an information center that provides services to IBM software users. These services include the APL language and modeling packages from SAS Institute, Inc. The services are offered on-line.

To introduce such services Beneficial Standard Corp. had to change its whole approach to DP operations within the company. In 1980, a new management team was established intent on improving productivity and lowering DP costs. The first of BCS' operation was spent cleaning up a backlog of 600 hours of computing time and new equipment was brought in.

This year, BCS expects either to break even or to show a profit on its budget of $6 million.

Another Company

Another company that has been doing well for its parent group is the McDonnell Douglas Automation Co. (McAuto), a subsidiary of aircraft manufacturer, McDonnell Douglas Corp. McAuto, which sells computer services both in-house and to outside corporations, was started 15 years ago when the group realised the peril of being in a one-product business, particularly one as volatile as airplane manufacture.

Since its inception McAuto has grown at an average rate of 20% a year and in 1981 accrued revenues of $450 million out of a corporate revenue total of $7.8 billion. The business is split almost evenly between in-house projects and outside commercial business.

Among the services McAuto provides to outside agencies are remote data services or software packages to hospitals and health care institutions; management control products for project control, as for example, with government or large corporation projects; software packages for the insurance industry; and a computerised system for Medicaid payments for the state of New York.

The company also claims to be getting into the minicomputer computer-aided design and manufacturing business with a product called Uni Graphics aimed at small discrete manufacturers, where 95% of US industry is based.

It also recently introduced a graphics package called Stradis/Draw for DPers and through a series of seminars has begun selling its Improved Systems Technology — a methodology of planning for future automation needs also aimed at the DP professional.

Other Airlines Beginning To Follow Lead

MIAMI — The success of Continental Airlines in selling its computer services to outside clients has led to other major carriers entering the computer services field.

Probably the most established competitor to Continental is Eastern Airlines, based here, which has offered its System 1 airline passenger reservation system to other airlines since 1975. The main clients are the smaller commuter airlines such as Bar Harbour Airline in Bangor, Maine; Provincetown Boston Airlines operating out of Hyannisport, Mass., and Naples, Fla.; and Atlantis Airlines in Florence, S.C. Eastern expects to add Metro Airlines, operating out of Houston and Atlanta, and Precision Airlines, North Springfield, Vt., later this year.

"We are expanding our IBM 3033 computer systems to handle more customers in 1983 and we expect to gain 15 to 20 extra commuter airline customers over the next year or two," said Don Prince, Eastern's manager for computer and communications sales and service.

Host of Software

In addition to System 1, the airline provides a host of software supporting systems including the Airline Computerized Tracing System (Acts) used for tracing lost baggage all over the world. Eastern has 103 customers for Acts including the major US airlines such as United Airlines, Pan American World Airways and Trans World Airlines.

Other computer services offered include terminal weather systems for obtaining information on local weather or storm warnings, flight planning for jet aircraft and flight control systems for commercial airlines and communications systems between aircraft and ground communications.

Competing with Eastern Airlines for commuter air passenger traffic is United Airlines through its Partners system based in Chicago. The system provides information on passenger seat reservations and flight availability and so far United has 10 clients including Mississippi Valley Airline, Aspen Airways in Denver and Air US.

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ADM 22 (ergonomic/edit/visual att.)	*	62
ADM 24 (ergonomic/graphics/256 f/fol)	*	72
ADM 32 (ergonomic ADM 31)	*	90
ADM 36 (DEC system terminal)	*	90
ADM 42 (8-page buffer available)	*	150
TI 940 (high performance, 1-page buffer)	1650	125
Hazeltine Esprit	575	59
Hazeltine Executive 80 Model 20	1345	95
Hazeltine Executive 80 Model 30	1695	109

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LA 120 RA (receive only)	2095	137
LA 120 AA DECwriter III	2295	147
LA 100 RO Letterprinter	1937	130
LA 12-A (port./modem/coupler)	2840	171
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TUESDAY—SEPTEMBER 21

1. *Keynote Address*—The Amazing Growth of The Software Industry in the 80's. 10:00 AM
Lawrence J. Schoenberg; ADAPSO Chairman, CEO, AGS Computers, Inc.
The packaged software industry, growing at a phenomenal 25-35% annual rate, will be *the major service industry* in the 80's. Mr. Schoenberg will analyze new software techniques and directions and offer insights into future software trends and their impact on you and your company.

2. Selecting Micro Software 2:00 PM
Burton Grad; Chairman, Heights Information Technology Services, Inc.
Burton Grad (President of the Software Industry Association ADAPSO) will show you, in detail, the various micro software selection processes that a DP manager or end-user must pursue.

3. Computers in Manufacturing 2:00 PM
Oliver Wight, Inc.
New technologies, systems and equipment emerge almost daily (CAD/CAM, Flexible Manufacturing, Robotics, Kanban, etc.) as the manufacturing and DP disciplines continue their rush toward total integration and interaction. If you have, or plan to have, a computers in manufacturing program, don't miss this session (also note Session 5).

4. All You Ever Wanted to Know About Software Ratings… 2:00 PM
Chairperson: Julia Johnston, Dir. Research and Statistics, ADAPSO
This panel presentation (including representatives from software rating companies) will take a hard look at the criteria used to rate software packages. The pros and cons of rating systems will be discussed and debated.

5. Manufacturing Software Users Panel 3:15 PM
Chairperson: Mike Sumwalt, DP Manager, United Pumps
Panelists: Mike Sutin, Dir. of Information Services, Boston & Main Corp.
Jim Crowley, Mfg. Systems Consultant, National Semiconductor
This "real-world" session by experienced users will highlight the implementation of manufacturing control systems from the MIS perspective. How to determine what you *really* want from a software package.

6. Software and Office Automation 3:15 PM
Chairperson: Carol Tomme Thiel, *Infosystems*
The automated office will be the catalyst for massive changes in the politics, style, and techniques of information dissemination. Data processing, telecommunications, and word processing will have to be fully integrated in order to provide voice, text and data services.

7. "One-Stop" Financial/Banking Services 3:15 PM
Ms. Marjorie B. Greene, V.P./Mgr., Chicago Operations, PACTEL, Inc.
Financial institutions in the future will rely increasingly on the provision of "one-stop" financial services which will include an entire range of information products.

WEDNESDAY—SEPTEMBER 22

8. Micro Software for Business 9:00 AM
Chairperson: Jerome L. Dryer, President ADAPSO
Micro software for business has grown dramatically in quality, compatibility, and availability. This panel of business micro users will analyze what now is on the market, what packages have worked well for them, and what the future for this technology might be.

9. Breaking The Programming Bottleneck (Part I) 9:00 AM
Chairperson: Donald Sundeen, Pres., Applications Software, Inc.
The programming bottleneck can delay and/or kill new projects, stymie new applications for existing projects, and destroy avenues of communication and morale between DP and corporate. Packaged software can break through this bottleneck, solving your applications problems, and freeing-up your programming staff.

10. Managing the Total Hardware/Software System 9:00 AM
Douglas C. Jerger, V.P., Appl. SW Div., University Computing Co.
Douglas Jerger's discussion will include package capabilities such as workstation control, late prompting, automatic scheduling, workload balancing, forecasting, history reporting and performance analysis.

11. Advanced Software Technology for Financial Modeling & Business Planning 10:00 AM
Chairperson: Ron Benanto, Mgr. Planning Services, Management Decision Systems, Inc.
Executives at major corporations are taking advantage of vast information resources in order to make better, more well-informed decisions. This session will review software alternatives.

12. Breaking The Programming Bottleneck (Part II) 10:00 AM
Chairperson: Donald Sundeen, Pres., Applications Software, Inc.
The programming bottleneck can delay and/or kill new projects, stymie new applications for existing projects, and destroy avenues of communication and morale between DP and corporate. (See Session 9.)

13. Business Graphics Software Today 10:00 AM
Chairperson: Arden J. Knudsen, Dir. of Communications Rapidata Div., National Data Corp.
Lively panel discussion of business graphics software with a look at graphics applications in the DP environment. You'll learn how you can apply it with benefits to your company.

14. *Luncheon Speaker*—What Programmer Shortage? NOON
David Eskra; Pres., Pansophic Systems, Inc.
David Eskra will show you how packaged software can overcome your applications backlog and put you on the road to productivity and profits.

THURSDAY—SEPTEMBER 23

15. *Industry Address*—Where We Go From Here 9:00 AM
John J. Cullinane, President & Chairman of the Board Cullinane Database Systems, Inc.
One of the true pioneers, and most well-respected leaders in packaged software, John Cullinane will bring you up-to-date on the industry.

16. Computer Capacity Management 10:00 AM
Chairperson: David E. Vincent; General Manager, Institute for Software Engineering
A user-oriented panel discussion covering capacity management techniques, values, implementation, justification, and integration with overall corporate goals. A study in the methods of need determination, means of acquisition, system justification and overall control of software and systems.

17. Selecting Systems Software 10:00 AM
A. David Tory; Vice President, Computer Associates, Inc.
This session will review the proven processes by which an end-user can identify his needs for systems software.

18. Software Conversion—How To Protect Your Investment 10:00 AM
Martin H. Tillinger; PhD, President, MHT Services, Inc.
Dr. Tillinger will explore the available methods of converting applications software to operate successfully in new hardware/software environments. The use of software for a cost-effective conversion will be discussed.

19. Micros as Part of an Overall Business System 11:15 AM
David E. Gold; President, David E. Gold Co.
An overview of the important role of micro computers and micro software in today's business environment. What they do or can do, how they do it, and how they can be profitably implemented into your company.

20. You Can't Program People 11:15 AM
Arnold E. "Arnie" Keller, Group Publisher, *Infosystems*
The users are the most important asset in any successful information processing system. How we communicate with them…and explain the "mysteries" of software…is a key factor.

21. User-Friendly Software Is Here Now 11:15 AM
Dr. Larry Harris; President, Artificial Intelligence Corp.
Artificial intelligence is one area of computer usage where great strides are being made. Dr. Harris will discuss one system which imposes no requirements for structure, syntax, punctuation, definitions or key computer words…and requires no special training or knowledge of computer codes.

Hear These Industry Leaders:

LAWRENCE J. SCHOENBERG
ADAPSO Chairman
Chairman, AGS Computers, Inc.
Schoenberg began his DP industry career as a member of IBM's programming research group. He has been associated with Litton Industries, Computer Sciences Corp.

DAVID J. ESKRA
President, Pansophic Systems, Inc.
Eskra's 17-year career in the DP industry includes being president of Cogna Systems Corp.; management consultant for Arthur Andersen & Co., Chicago; and management positions with RCA and ITT Data Services.

JOHN J. CULLINANE
President, Cullinane Database Systems, Inc.
A graduate of Boston's Northeastern University, Cullinane is a member of the Board of Directors of the Massachusetts High Technology Council, CAMEX, Inc., SofTech, Inc., and Essex Investment Mgmt. Co., Inc.

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Contracts & Pacts

Honeywell, Inc. and Mantech, Inc. will market a computer-aided design product, CAD2D system, developed by the Cadcon Division of Mantech. It will be available on Honeywell's 32-bit DPS 6/92 computer.

Tesdata Systems Corp. will supply Racal-Milgo, Inc. with an undisclosed number of data communications monitoring systems over the next three years under the terms of a multimillion-dollar agreement. Racal-Milgo will incorporate Tesdata's RM 200 and RM 300 systems into its advanced data communications network management systems.

Xebec, an MSC company, has been awarded a contract valued in excess of $6 million for an undisclosed number of Xebec's S1410 5¼-in. Winchester disk controllers by International Computers, Ltd., the UK's largest computer manufacturer.

Archive Corp. has been awarded a $1 million contract by Plexus Computers, Inc. Under the terms of the agreement, Plexus will incorporate Archive's 20M-byte intelligent sidewinder ¼-in. streaming cartridge tape drives into their P/25 minicomputers.

Colorado State University has received a three-year, $386,666 grant from the U.S. Army Research Office. The grant will be used to evaluate VAL, an application programming language, and compare it with conventional languages such as Fortran.

Floating Point Systems, Inc. and Digital Equipment Corp. have entered into a cooperative marketing agreement to market Floating Point's array processor and DEC's VAX computer combination for use in computation-intensive applications in the scientific and engineering markets. Each company will retain responsibility for selling and servicing its respective products under the agreement.

An arrangement between Sperry Univac and Floating Point Systems, Inc. will provide new enhancements to array-processing capabilities for Univac 1100 series computers. The agreement includes a joint development of an interface between the FPS-164 to attach to 1100/80 and 1100/60 series computers, the availability of a multiuser handler for interfacing the FPS AP-190L to the 1180/80 and 1100/60 series computers and an arrangement between the two firms for cooperative marketing.

Sony Corp. will supply its 3½-in. micro floppy disk system to Jonos, Ltd. of Anaheim, Calif. Jonos will use the system in its Courier series, Diplomat series and its Sentry series of computers. The contract is valued in excess of $1 million.

Logicon, Inc. has received two exploratory development contracts totaling $1.5 million from the U.S. Air Force System Command's Rome Air Development Center in the fields of artificial intelligence and knowledge-based systems. Logicon has also received increased funding of $3 million from the Ballistic Missile office to continue providing software support services for the Strategic Air Command's single integrated operational plan.

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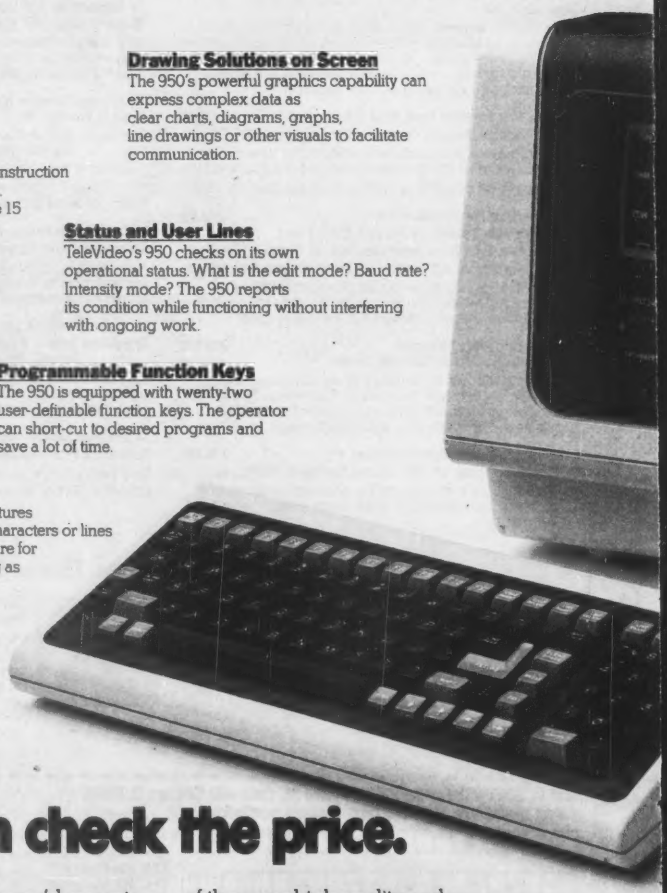

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Contracts & Pacts

Raytheon Data Systems Co. has been awarded the largest single contract in the company's history as a result of the successful bid by Electronic Data Systems Corp. (EDS) for the Army's Viable program. As a subcontractor for EDS, Raytheon will supply 18,000 terminals and printers to 47 Army posts in the U.S. and in the Canal Zone. The 10-year contract is valued at approximately $100 million.

Century Data Systems, Inc. has received three contracts totaling over $2 million for its Trident line of removable pack disk drives. Voice and Data Systems of Chicago will purchase 200 units; Pro Data Corp. of Cleveland has ordered 50 units; and SBAA Marketing, Inc. of Cape Girardeau, Mo., has ordered 25 units.

C3, Inc. has been awarded a multiyear requirements contract by the Internal Revenue Service (IRS) to provide 11 computer systems -- one in the national office in Washington, D.C., and one in each of the 10 IRS centers. The systems will be used to create and maintain a data base of accounting-related information. The contract is valued at $2.9 million.

AT&T has renewed its two national purchasing agreements with Codex Corp. for Codex Line Sharing Units and Local-Area Data Sets. Codex estimates that the renewals will produce a combined volume of approximately $7 million.

Burroughs Corp. has selected Dataroyal, Inc.'s IPS-5000-A intelligent dot matrix printers as a customer option for its new B-20 desktop computer system. Terms of the multiyear OEM agreement were not disclosed.

Sonicraft, Inc. of Chicago has been awarded a 21-month, $32 million contract by the U.S. Air Force Systems Division through the Small Business Administration. The award has the potential of being the largest single series of total system program contracts ever awarded to a minority firm by the federal government, according to an Air Force spokesman. Sonicraft will design and develop communications equipment to improve the accuracy and speed of printed emergency action messages sent from the President and the National Command Authority to worldwide U.S. strategic forces. A review by the Air Force of the design and development work may lead to an award of a 24-month, $33 million contract for fabrication and testing. Upon successful completion of the test phase, Sonicraft would receive a $203 million production contract.

CIE Systems, Inc. has signed a five-year, $50 million contract to supply General Automation, Inc. (GA) with CIE Systems' new 680 business computer systems. Delivery of 1,000 systems is scheduled for the third quarter of 1982. GA will market the 680 systems under its own name in the U.S. and in 40 countries worldwide.

Intermetrics, Inc. has been awarded a $7.1 million contract by the U.S. Air Force to develop a set of computer software tools for large military systems using the Ada language.

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Executive Corner

• Marge Dunn, co-founder of Pro-Log Corp., has been named president and chief operating officer of the firm.

• Howard N. Smith has been appointed president and chief executive officer of Kurzweil Computer Products, Inc., a subsidiary of Xerox Corp.

• Pierre Asancheyev has been appointed president and chief executive officer of R2E of America, the North American subsidiary of R2E of France, Inc.

• James B. Sherman has joined Datec, Inc. as vice-president of research and development. A. Ray Detitta has been named vice-president of finance for the firm.

• James F. Holmes Jr. has been appointed vice-president of Dimension Industries, Inc.'s subsidiary, Dimension Funding Corp.

• Douglas J. Craft has been appointed vice-president of finance for the Weiland Computer Group, a part of the Banking Services Division of Sun Information Co.

• Fred P. Heidenthal has been named vice-president of finance and chief financial officer of Britton-Lee, Inc.

• David P. Goldsmith has been promoted to vice-president of communications for National Advanced Systems, Inc.

• Richard Bush has been named vice-president of sales and marketing at Bridge Communications, Inc.

• John E. McNaughton has been promoted to vice-president of customer and technical services at Quality Microsystems, Inc.

• Anthony Prestigiacomo has been appointed vice-president of engineering for Information Displays, Inc.

• John T. Floyd has been named vice-president of manufacturing for Computer Devices, Inc.

• William C. Taylor has been elected executive vice-president and Bob M. Olson and John F. Wilson have been elected senior vice-presidents of ITT World Communications, Inc., a unit of ITT.

• James Lucchese has been appointed vice-president of finance and treasurer of M/A-COM DCC, Inc.

• Robert D. Baskerville has been named vice-president of group staff for Computer Sciences Corp.'s Infonet Group.

• Jackson D. Maxey has been named vice-president and general manager of E-Systems, Inc.'s ECI Division.

• Donald M. Campbell has been appointed senior vice-president and chief financial officer for Magnuson Computer Systems, Inc.

• Richard Smith has been named executive vice-president of EXO Corp.

• Webb Castor has been appointed senior vice-president of marketing and service of Xerox Corp.'s Printing Systems Division.

Nickels & Dimes

IBM has filed a registration statement with the Securities and Exchange Commission for a proposed public offering of $500 million of convertible subordinated debentures due in 2007.

In addition, at its latest meeting, the firm's board of directors also voted a regular 86 cents per share dividend.

$ $ $

Honeywell, Inc. has increased its quarterly dividend on common stock to 90 cents a share. The quarterly dividend has been 85 cents a share since July 1981.

$ $ $

DMA Systems Corp. has completed its second round of venture capital financing and established a bank line for a total of $18.2 million. Investors include Brentwood Associates, Southwest Venture, Charles River Partnership, Greyhound Computer Corp., Berkeley Consulting Group, Boston University and the General Electric Pension Trust. The bank line was established by Security Pacific National Bank and the Bank of California.

$ $ $

Summagraphics Corp. has obtained private funding of over $6 million. Participants include American Research and Development, a division of Textron, Inc.; Anderson Investment Co.; Oak Management; Connecticut General Life Insurance Co.; Hambrecht & Quist; Bessemer Venture Partners, L.P.; Industrial Development Partners GmbH & Co., K.G.; Interwest Partners; Matrix Partners, L.P.; Vista Ventures Corp.; Citibank, N.A.; Fairfield Venture Capital Fund, L.P.; L.F. Rothschild, Unterberg & Towbin; Venture Capital Fund; and Rensselaer Polytechnic Institute.

Orders & Installations

Planning Research Corp. has received a one-year, $5.2 million extension of its contract to manage and operate the National Aeronautics and Space Administration's Scientific and Technical Information Facility near Baltimore, Md.

Dynabyte Business Computers, Inc. will supply National Semiconductor Corp. with its 16-bit/8-bit Monarch systems as well as systems from its 8-bit Series 5000 under the terms of a multiyear contract. The contract has a potential value of up to $4 million.

The Military Traffic Management Command has leased, with an option to buy, 15 Quiet 300/3780 impact line printers from Local Data Co.

Middle South Utilities, Inc., a holding company for independent utilities in Louisiana, Mississippi, Arkansas and part of Missouri, has doubled its computing power with the addition of an IBM 3081 processor.

Moves to Micros

Brazil Computer Industry Changes Direction

By Bohdan O. Szuprowicz
Special to CW‡

Brazil, which nationalized its minicomputer industry in 1977, is now making a bid to become a microcomputer power.

Recent press reports indicate that Brazil's third-largest banking conglomerate, Banco Itau, has been granted government permission to research and develop a Brazilian microelectronics industry based on as yet unindentified foreign technology. Two domestic development firms have been authorized by the government to get the Brazilian microelectronics industry under way.

When Brazil decided to take over the minicomputer market five years ago, the government created Digibras, an organization mandated to develop a domestic minicomputer manufacturing industry through assistance in the formation of joint ventures, financing and acquisition of foreign technology. The Brazilians call such activity stimulation of local industry in an environment of "restricted competition," which is supposed to maximize scarce production resources and save foreign exchange by prohibiting or limiting imports of comparable equipment from abroad.

Digibras was instrumental in creating four domestic minicomputer manufacturing firms by inducing a number of private Brazilian firms to provide the bulk of the capital to develop minicomputers in Brazil while the government guaranteed the market by prohibiting imports. The first Brazilian minicomputer firm, Cobra, using Ferranti and Sycor, Inc. technology, came into being as early as 1974 and was somewhat of an inducement to other investors to jump into the fray when its sales skyrocketed from $210,000 in 1975 to $12.4 million by 1977.

Banco Itau was one of the original investors in Cobra, along with a consortium of at least eight other Brazilian banks that together controlled at least 39% of the company's stock.

Other Firms

The formation of Edisa, Labo and SID followed rapidly in 1977 and 1978, based on minicomputer technologies from Facom in Japan, Nixdorf in Germany and Logabax S.A. in France, respectively. Digibras estimated that sales of minicomputers would grow to about 3,000 units per year by 1982, bringing the country's installed base to nearly 14,000 by then. Some of the new firms were expecting to reach sales on the order of $50 million to $100 million within the first five years.

However, current market estimates of minicomputer sales in Brazil for 1982 are only 20% to 26% of the levels projected by Digibras five years ago. Its estimates of potential end users of minicomputers were fairly accurate, but it did not take into account the emergence of the microcomputer industry that was blossoming all over the world during the same period of time when the Brazilian minicomputer manufacturers were getting started.

Bureaucratic delay and central government control of "restricted competition" proved no match for the forces of rapid technological innovation that are characteristic of electronics in general and the computer industry in particular. Alongside eventually six Brazilian minicomputer manufacturers, at least 20 new microcomputer manufacturers were established that are already offering about 30 different microcomputer models and captured almost 80% of the end-user market that was supposedly reserved for the minicomputer manufacturers.

The original Brazilian minicomputer firms are now getting into this field, and most have come out with their own microcomputers. Those firms are trying to beat domestic competition, but they are saddled with heavy investments in a minicomputer technology that is now obsolete.

The Brazilian minicomputer manufacturers also failed to capture any significant export markets and this shattered their hopes of contributing to the balance of payments. However, they made significant inroads into the domestic service bureau industry, where Brazilian minicomputers are often operating alongside the IBM and Burrough Corp. equipment that makes up about half of all the installations in that industry sector.

While IBM and Burroughs have about 36% and 22%, respectively, of the 350 machines operating in the major 250 service bureau centers in Brazil, Cobra is third with 17%. When all the Brazilian mini makers are taken into consideration, they account for 28% of all service bureau installations, making them second only to IBM. IBM has the edge because most of its computers are large or medium-size machines of the 370/148 caliber and even larger.

Perhaps the most significant aspect of the new Brazilian microelectronics offensive, however, is the level of investment that Itautec, the technical subsidiary of Banco Itau, is making. At $50 million of initial capital, this is almost twice the amount that Digibras and all the private investors managed to scrape up to start the four Brazilian minicomputer companies.

The results should not be long in coming; Itautec is already threatening that a new microelectronic firm will be coming out with its first computer as soon as 1983.

Salaries for Execs In Electronics Up

PALO ALTO, Calif. — Base salaries for executives at electronic firms increased an average of 9.6% from 1981 levels, according to the American Electronic Association's (AEA) 1982 "Executive Compensation Survey."

This compares with average increases of 9.9% in 1981 and 9.2% in 1980.

Salaries of chief executive officers (CEO) averaged a 10.4% increase from last year. But companies' second executives — general managers, treasurers and top sales executives — racked up the highest pay increases, with 10.5% being the average.

While salary levels advanced at a slightly higher rate or about even with prior years, bonus payments as a percentage of salary fell to a three-year low, the survey pointed out. Bonuses averaged 24% of salary last year, down from 25.3% in 1980 and 32.8% in 1979.

Hardest hit have been CEOs whose bonuses last year averaged 36% of salary, compared to 40% in 1980 and 51% in 1979.

The annual compensation survey is based on salary data from 953 AEA member organizations covering 6,000 executives. Companies surveyed have annual sales of more than $1 million.

The AEA does not release specific salary figures and the survey is not available to nonmembers.

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Record Six Months in '82

Capital Abounds for 'Right' Projects: Survey

By Bob Johnson
CW New York Bureau

NEW YORK — There is currently plenty of investment money available for new computer-related businesses. However, obtaining financing hinges on just what kind of computer business would-be entrepreneurs are proposing.

That was the consensus of Wall Street venture capital analysts and sources close to the industry who were interviewed recently about what effect, if any, the depressed economy is having on computer start-ups.

Although the ability to get financing for personal investments is difficult, respondents in the survey all agreed that there is more than enough investment dollars around for the right computer venture. In fact, statistics compiled by the *Venture Capital Journal* of Wellesley, Mass., the venture capital industry's leading publication, indicate that the first six months of 1982 set a record for the amount of overall investment capital available.

Jane Morris, managing editor of the journal, said that about a third of that money is invested in high-tech companies. She revealed that in 1981 computer-related businesses made up 30% of the total number of companies invested in and represented 34% of the actual dollar investment. She compared those figures to 1981 when computer companies made up only 27% of those investments and only 26% of invested dollars.

Richard Cawley, a member of the Rain Hill Group venture capitalist firm, supported those figures and said that there is "a ton of cash" out there but pointed out that a new idea has to be sound. "There is a lot of money, but not a lot of good entrepreneurs. For every Gene Amdahl there are a thousand other bodies interested in starting a company," he said.

According to Cawley, the people involved in a start-up business are a very important factor to be studied before any backing is even considered. He said, for instance, a proposed hardware product or "box" doesn't result in a successful business proposal. The critical factor is the person who "makes it and sells it." There is certainly enough money around for good deals but the difficulty is finding the right package, or combination of management talent and product, he said.

When asked what areas of the computer industry are now the most attractive to his company for investment, Cawley responded that hardware and software interface controls are the "highest order of search" at this point.

Agreeing with Cawley as to the availability of investment cash was Kip Moore, a general partner at the firm of Welsh, Carson, Anderson & Stowe. Moore said that he thinks there is as much or more funding available for information processing and computer-related companies than ever before. Actually, Moore stated, there is now more money for ventures than can be wisely invested. However, only a fraction of the proposals can be considered seriously, he added. His company is aggressively looking for microcomputer software products.

"When you are selling software to large system users you have limited penetration, so you are forced to ask higher prices. Small system software is much cheaper and the market is much larger making for a better investment," he explained.

Moore added that the least attractive investments are in the semiconductor and semiconductor service areas. He said that the investments for these ventures are extremely high and the market is not currently in need of them.

A principal at a metropolitan area venture capital firm who wished to remain anonymous had a somewhat different analysis of the market. Although agreeing that there is money to be had, he said that venture firms are not "jumping at deals" the way they did in the last two to three years. He described the venture capitalist's interest in the computer field as "more discriminating" than in the past because of an apparent down cycle in the stock market.

"In 1979, 1980 and 1981 deals got done at incredible prices with money flowing at an accelerated rate. Now, however, a measure of sanity has returned to investing because of apparent stock drops at computer-related companies," he said.

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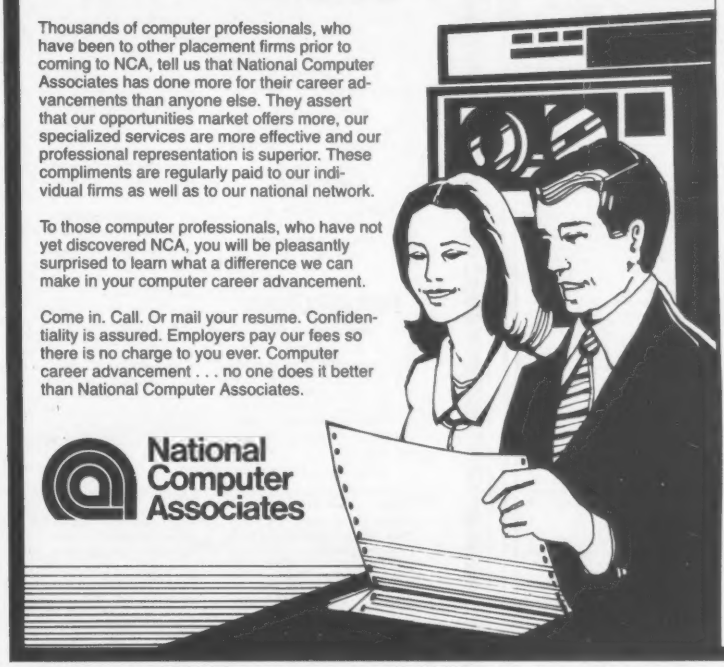

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Southern Company Services

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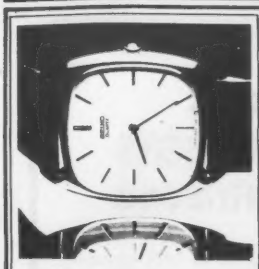

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Major responsibilities will be designing and implementing of applications systems over a wide range of hardware environments. Will participate in all phases of product design from initial system specifications through on-site installation.

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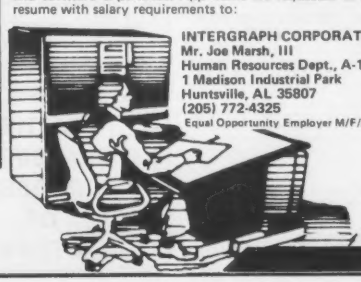

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Responsible for daily monitoring of system-wide performance of an MVS/SP1 installation in a multiple CPU shared DASD environment. Additionally, responsible for development and establishment of procedures in this newly defined functional area. Should have extensive experience using performance tools such as real time monitoring and SAS programming. Strong analytical and statistical background preferred plus applicable experience in what-if software modeling.

Please mail resume and salary history to Employee Relations department. Principals only.

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The Director is responsible for providing leadership to the staffs of the two centers, managing the resources (DEC 2060, Harris H500, IBM 4341) and operating budget ($2,000,000), and planning for the continuing integration of data processing, word processing and other University communications functions.

Minimum Qualifications: a Bachelor's degree in an appropriate discipline, preference to graduate degree. Five to 8 years experience in data processing, with significant managerial responsibility. Salary is negotiable, based upon experience. Deadline for applications is September 15, 1982. Letters of application, reference and resumes should be sent to:

Dr. William J. Young
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The University of Vermont
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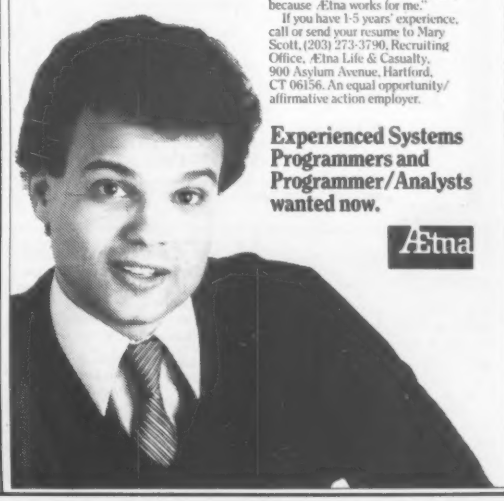

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Director of Employment Colonial Williamsburg Foundation P.O. Box C Williamsburg, VA 23187

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SENIOR PROGRAMMER ANALYST

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CSC

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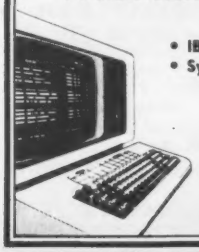

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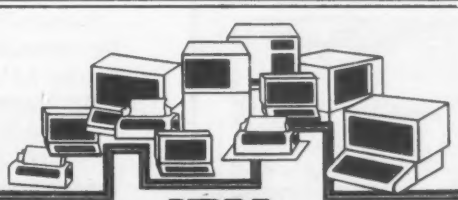

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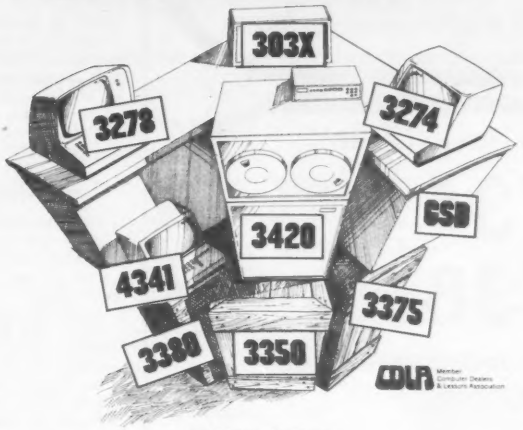

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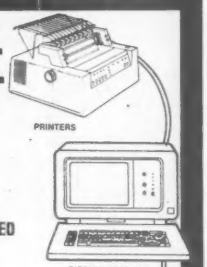

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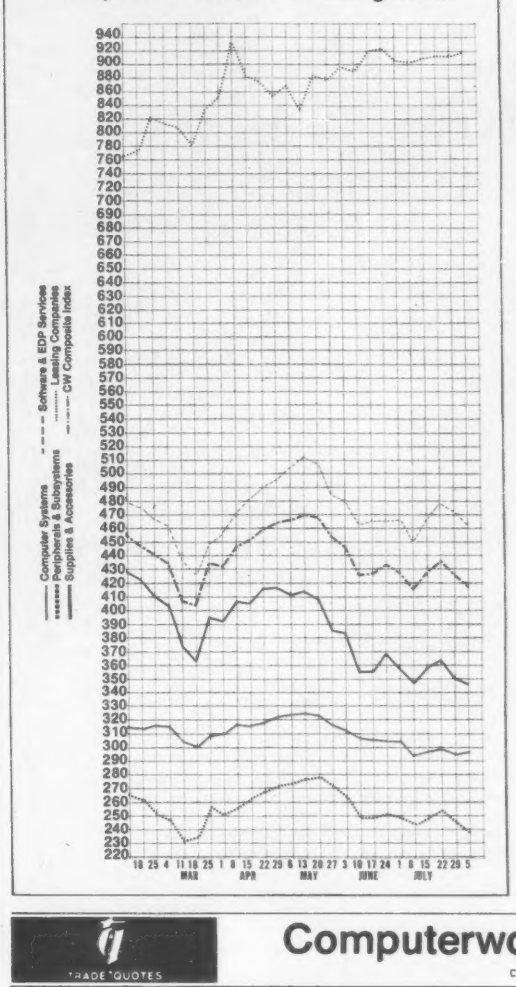

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A	AMDAHL CORP	18- 46	21	+1 1/8	+5.6
N	BURROUGHS CORP	28- 72	31	-1 3/8	-4.2
O	COMPUTER AUTOMATION	8- 28	8 3/4	0	0.0
N	CONTROL DATA CORP	19- 42	23 3/4	-1 1/4	-5.0
N	CRAY RESEARCH INC	20- 49	22 1/4	- 7/8	-3.7
N	DATA GENERAL CORP	24- 87	25 1/8	+ 3/4	+3.0
N	DATAPOINT CORP	11- 68	12 1/2	-1 1/8	-8.2
N	DIGITAL EQUIPMENT	64-113	63 7/8	-1 1/4	-1.9
A	EECO INC	6- 18	7 1/8	- 1/4	-3.3
N	ELECTRONIC ASSOC.	5- 13	8 1/4	+ 1/8	+1.5
N	FLOATING POINT SYST	13- 30	18 1/2	-1 1/4	-6.3
N	FOXBORO	24- 62	24 1/4	-2 1/4	-8.4
O	FULCRUM COMP GRP	1- 3	1/4	0	0.0
O	GENERAL AUTOMATION	3- 16	3 3/8	- 1/8	-3.5
N	HARRIS CORP	21- 60	26 1/8	- 3/8	-1.4
N	HEWLETT-PACKARD CO	32- 94	41 1/4	-1 1/2	-3.5
N	HONEYWELL INC	63-115	86 1/2	-1 3/8	-2.0
N	IBM	49- 73	65 5/8	+ 3/4	+1.1
O	IPL SYSTEMS INC	6- 13	5 1/2	- 1/2	-8.3
O	MAGNUSON COMP SYSTS	2- 32	1 3/4	0	0.0
N	MANAGEMENT ASSIST	9- 28	9 1/8	- 1/8	-1.3
O	MINI-COMPUTER SYST	0- 4	1/2	+ 1/8	+33.3
N	MODULAR COMPUTER SYS	7- 32	7 1/4	+ 1/4	+3.5
N	MOHAWK DATA SCI	10- 32	11 5/8	-1 1/4	-9.7
N	NCR	39- 76	52	- 1/4	-0.4
N	PERKIN-ELMER	18- 38	17 5/8	- 3/4	-4.0
N	PRIME COMPUTER INC	16- 49	17 1/8	+ 1/8	+0.7
N	SPERRY CORP	21- 65	21 5/8	+ 1/2	+2.3
O	TANDEM COMPUTERS INC	13- 35	15	-1 3/4	-10.4
N	TEXAS INSTRUMENTS	71-151	83 7/8	-5 1/4	-5.8
A	WANG LABS.	22- 48	26 5/8	+3 1/8	+13.2
	LEASING COMPANIES				
O	BOOTHE FINANCIAL CP	18- 28	22 1/4	- 1/4	-1.1
N	COMDISCO INC	18- 27	17 3/8	-1	-5.4
B	COMMERCE GROUP CORP	1- 1	5/8	0	0.0
O	COMPUTER INVSTRS GRP	1- 2	3/8	0	0.0
O	CONTINENTAL INFO SYS	4- 9	8 1/4	+ 1/2	+6.4
N	DPF INC	5- 13	8 3/4	+ 1/2	+6.0
O	ITEL	1- 5	5/8	0	0.0
O	LEASPAC CORP	1- 2	1/8	0	0.0
N	U.S. LEASING	18- 30	23 1/4	- 3/8	-1.5

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH; B=BOSTON
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

E X C H		1981-82 RANGE (1)	CLOSE AUG 4 1982	PRICE WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 6	1 3/4	0	0.0
O	ADVANCED SYSTEMS INC	10- 15	11 1/4	- 1/4	-2.1
O	AGS COMPUTERS INC	7- 10	7 5/8	- 3/8	-4.6
O	ANACOMP INC	10- 19	8 7/8	-2 5/8	-21.0
O	ANALYSTS INTL CORP	3- 14	8 1/4	+ 1/4	+4.1
A	APPLIED DATA RES.	13- 25	21 3/8	- 3/8	-1.7
O	ASK COMPUTER SYSTEMS	11- 17	15	-1 1/8	-6.9
B	ASTRADYNE COMP IND	1- 5	1 3/8	+ 1/8	+10.0
N	AUTOMATIC DATA PROC	22- 32	23 3/4	+ 3/4	+3.2
O	CGA COMPUTER ASSOC	4- 25	6	- 1/4	-4.0
O	COMPUTER ASSOC INT'L	12- 20	18	- 1/4	-1.2
O	COMPUTER HORIZONS	1- 3	2 1/2	0	0.0
O	COMPUTER NETWORK	4- 9	5 5/8	- 1/4	-4.2
N	COMPUTER SCIENCES	11- 30	12 5/8	- 3/8	-2.9
O	COMPUTER TASK GROUP	10- 23	10 1/4	- 3/4	-6.8
O	COMPUTER USAGE	2- 10	2 5/8	0	0.0
O	COMSERV CORP	8- 18	13	+ 1/4	+1.9
O	COMSHARE	8- 21	9 7/8	- 5/8	-9.6
N	CULLINANE DATABASE	15- 37	27	- 5/8	-2.2
O	CYCARE SYSTEMS INC	9- 14	9 1/4	-1 1/2	-13.9
O	DATA DIMENSIONS INC	1- 3	3/8	0	0.0
O	DATATAB	1- 4	1/2	0	0.0
O	DYATRON CORP	2- 11	3 1/8	+ 1/4	+8.6
N	ELECTRONIC DATA SYST	15- 30	26 1/2	0	0.0
O	INFORMATICS INC	10- 23	10 3/4	-1 1/8	-9.4
O	INSYTE CORP	1- 3	2 1/2	0	0.0
O	IPS COMPUTER MARKET.	1- 2	1 1/4	0	0.0
O	KEANE ASSOCIATES	4- 8	4 1/2	+ 1/4	+5.8
A	LOGICON	12- 38	13 7/8	- 1/4	-1.7
O	MNGT SCI AMER INC	17- 28	20 1/4	- 1/2	-2.4
O	MATHEMATICA INC	8- 17	13 3/4	- 1/4	-1.7
O	MATHEMATICAL APP GRP	14- 28	14	-1	-6.6
O	NATIONAL DATA CORP	13- 28	14 3/4	0	0.0
O	PANSOPHIC SYSTEMS	8- 13	10 1/2	- 1/4	-2.3
N	PLANNING RESEARCH	5- 13	8 1/2	- 1/2	-7.1
O	PROGRAMMING & SYS	1- 2	1 3/8	-	-4.1
O	REYNOLDS & REYNOLD	18- 28	20	- 1/2	-2.4
O	SEI CORP	17- 28	22	+ 3/4	+3.5
O	SHAREVE MEDICAL SYST	28- 37	29	-1 3/4	-5.6
O	SISC INC	8- 28	10	+ 1/4	+2.5
O	SCIENTIFIC COMPUTERS	8- 18	7	+ 1/8	+1.8
O	SOFTWARE AG	5- 23	8	- 1/8	-2.0
N	TYMSHARE INC	13- 58	15 7/8	-1	-5.8
A	URS CORP	10- 18	10	- 1/8	-1.2
N	WYLY CORP	7- 20	8 3/4	- 1/2	-4.8
	PERIPHERALS & SUBSYSTEMS				
N	AM INTERNATIONAL	1- 15	1 1/8	-	-5.3
A	ANDERSON JACOBSON	8- 28	8 1/4	+ 1/8	+1.5
O	AUTO-TROL TECHNOLOGY	9- 82	11 1/4	-1	-8.1
O	BANCTEC INC	7- 35	7 3/4	0	0.0
O	BEEHIVE INT'L	8- 18	4 5/8	- 7/8	-15.8
A	BOLT,BERANEK & NEW	8- 25	14 1/2	- 3/8	-2.5
O	CAMBEX CORP	2- 8	1 7/8	0	0.0
N	CENTRONICS DATA COMP	7- 40	8	0	0.0
A	CETEC CORP	4- 8	4 1/8	- 1/4	-5.7
O	COGNITRONICS	2- 11	3 3/8	- 3/8	-10.0
O	COMPUTER COMMUN.	1- 2	1/2	0	0.0

E X C H		1981-82 RANGE (1)	CLOSE AUG 4 1982	PRICE WEEK NET CHNGE	WEEK PCT CHNGE
A	COMPUTER CONSOLES	16- 28	20 1/4	+ 1/4	+1.2
O	COMPUTER DEVICES INC	4- 10	10	+ 1/4	+2.5
O	COMPUTER TRANSCEIVER	2- 9	4 1/2	- 1/4	-5.2
N	COMPUTERVISION CORP	20- 49	20 1/8	-2	-9.0
N	CONRAC CORP	17- 28	24 1/8	+ 5/8	+2.6
A	DATA ACCESS SYSTEMS	2- 15	1 1/2	0	0.0
A	DATAPRODUCTS CORP	16- 44	17	-1	-5.5
O	DATARAM CORP	4- 15	7	- 5/8	-8.1
O	DATUM INC	2- 5	2	- 1/8	-5.8
O	DAVID JAMISON CARLYL	3- 7	3	- 1/4	-7.6
O	DECISION DATA COMPUT	3- 6	5 1/4	+ 1/4	+5.0
O	DELTA DATA SYSTEMS	1- 4	1 1/2	+ 1/8	+9.0
N	ELECTRONIC M & M	3- 9	4 1/4	+ 1/4	+6.2
O	EVANS & SUTHERLAND	18- 40	20 3/4	0	0.0
N	GEN'L DATA COMM IND	7- 18	9 1/8	- 1/2	-5.1
O	GENERAL TERMINAL CP	0- 4	1/4	- 1/8	-33.3
O	GREAT SOUTHWEST IND	1- 12	3 1/4	- 1/2	-13.3
N	HAZELTINE CORP	19- 35	26 5/8	- 3/8	-1.3
O	INFORMATION INTL INC	8- 17	12 3/4	+ 1/4	+2.0
O	INTEL CORP	21- 51	31 3/4	-1	-3.0
O	IPL SYSTEMS INC	5- 15	5 1/2	- 1/2	-8.3
A	LUNDY ELECTRONICS	7- 18	9 7/8	- 1/4	-2.4
A	MSI DATA CORP	11- 27	15 1/8	0	0.0
O	NETWORK SYSTEMS CORP	14- 25	16	- 3/8	-2.0
O	OMEX	3- 8	3 1/2	0	0.0
N	PARADYNE CORP	29- 52	26 3/8	-1 5/8	-5.8
A	PENRIL CORP	7- 17	8 7/8	+ 3/8	+4.4
O	RAMTEK CORP	9- 23	15	- 3/4	-4.7
N	RECOGNITION EQUIP	4- 21	4 3/8	- 1/8	-2.7
O	SCAN DATA	1- 5	1 1/4	0	0.0
N	STORAGE TECHNOLOGY	17- 40	16 3/4	- 5/8	-3.5
O	SYKES DATATRONICS	8- 34	13	- 1/4	-1.8
A	T BAR INC	7- 19	7 5/8	- 3/8	-4.6
A	TEC INC	4- 11	10	- 1/4	-2.4
N	TEKTRONIX INC	39- 70	38 5/8	-5 5/8	-12.7
N	TELEX	5- 10	8 3/8	- 5/8	-6.9
O	TESDATA SYSTEMS CP	3- 17	3 1/8	0	0.0
A	TIMEPLEX INC	7- 19	8 7/8	- 1/8	-1.3
O	VISUAL TECHNOLOGY	10- 15	11 3/4	+1	+8.3
O	WILTEK INC	1- 3	1	0	0.0
	SUPPLIES & ACCESSORIES				
N	AMERICAN BUS PRODS	11- 17	12 3/4	0	0.0
O	BALTIMORE BUS FORMS	1- 2	1	0	0.0
N	BARRY WRIGHT	14- 24	16 1/4	+ 3/4	+4.8
O	CYBERMATICS INC	1- 2	1	0	0.0
A	DUPLEX PRODUCTS INC	12- 17	13 7/8	- 1/8	-0.8
N	ENNIS BUS. FORMS	15- 23	18	- 3/8	-1.9
N	3M COMPANY	48- 65	54 1/4	+ 3/4	+1.4
O	MOORE CORP LTD	28- 30	28 7/8	- 5/8	-2.1
N	NASHUA CORP	9- 33	9 3/8	+ 1/2	+5.6
O	STANDARD REGISTER	30- 43	42 3/4	+ 1/4	+0.5
A	TAB PRODUCTS CO	13- 30	13 5/8	+ 1/8	+0.9
N	WALLACE BUS FORMS	22- 36	29 5/8	- 3/8	-1.2

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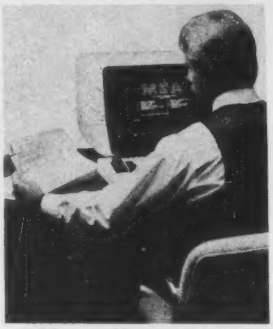

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